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THE DEVELOPMENT OF THE SCIENCE AND PHILOSOPHY OF AMERICAN RURAL SOCIETY¹

This summary is not a history of the progress of American farm life, nor is it a defense of rural sociology as a science, although a narrative of occasional pleas for a fair hearing on this matter in the last twenty years might have some historical interest. It is to be especially regretted, moreover, that agricultural economists and rural sociologists have been slow to accord, each to the other, an undisputed place and field in rural research. Harmony among these two groups, which still stand together as pretenders in the eyes of mathematically minded scientists, would prove advantageous to each other and to rural society.

I shall not attempt to recount or summarize the various investigations made by rural sociologists up to the present time, nor to assess their influence on rural life in the United States. Such an undertaking would merit a doctoral dissertation. I shall, however, attempt a historical statement involving the actors and events in the progress of thought concerning the problems of life among farmers in the past fifty years, and say a word or two about life in farm communities at the beginning of this period, as a springboard into the stream of thinking about rural life.

The contrast between the social privileges enjoyed by the upper strata of city and farm people was strikingly in favor of the former. It is true that the New England academy and the Southern type of private school were bringing the benefits of secondary education to a select portion of farm youth, a few of whom were going on to college and university. Church schools of academic grade and church colleges were picking up promising young men from the farms and setting them down in town and country parishes as clergymen. The country church had a

¹ Address before the Agricultural History Society at Washington, D. C., on Feb. 8, 1938.

fairly educated ministry and the Chautauqua correspondence courses were appealing to some rural women. Well-known itinerant lecturers came to some rural communities and a few—a very few—farmers' clubs were in operation. The Grange was a blessing in scattered communities of a few States, and the Y. M. C. A. was laying the base for county units. The country doctor was driving his horse or team through the mud of country roads, and the country store and small trade center had to suffice for the farm family's supplies. Prosperous farmers in middle life were retiring to town for social advantages. Farm tenancy was rising fast. Farm youth was on the move to cities. Rural houses and kitchen appliances challenged the stout-heartedness of farm women. Let this bald summary stand as a background for our special topic and a preface to the introduction of the personalities and ideas which now come upon the scene for our consideration.

THE HUMANITARIAN STAGE

I shall not attempt to name the first person who uttered sober, influential ideas on rural life in the United States fifty years ago. Origins being vague are highly controversial, and I am not a controversialist. For convenience, let me call the first stage of this period the Humanitarian,—the stage of pity, sympathy, and active desire to better rural life by means already known and fairly near at hand. The State of Michigan, besides being the home of the first college of agriculture, may be linked with several people, who, at one point or another, enter this chronicle: Charles R. Henderson, Kenyon L. Butterfield, Liberty Hyde Bailey, Ernest Burnham, Dwight Sanderson, and C. J. Galpin. Of these Butterfield, Bailey, and Sanderson were born and educated in Michigan. Galpin attended school there at the age of four, and again at twelve; later in 1888 he taught at Kalamazoo College. In 1902, Butterfield began a course in rural sociology at the University of Michigan, and Burnham offered a similar course at the Western State Teachers' College at Kalamazoo in 1904.

When I first met Henderson fifty years ago, he was a Detroit

clergyman, tall, slim, sane, methodical,—an ardent humanist. About 1892, when President Harper was rounding up men with whom to build the University of Chicago, he chose Henderson, the humanist, and made him a professor of sociology,—alongside Professor Albion W. Small who was the nucleus of the Chicago sociologists,—specializing in poverty, charities, crime, corrections, social welfare, and the sociology of religion. Henderson looked out on a world of persons, possessing not only souls, but bodies; not only bodies, but souls. His thought started with these people, and then went on to wages, profits, wealth, houses, and playgrounds, but did not stop there. After these foraging expeditions into the standards of living, he always came back to personalities having souls and bodies, and he thought on about their way of life. I speak thus confidently, for I knew him both personally and professionally until his death. Henderson's range of view took in the American farmer, his family, his community, his institutions, and his disabilities as they existed fifty years ago, and when he became a sociologist at the University of Chicago, rural institutions was one of his courses. He recognized the high spots in the rural society of his day, but what he mainly saw was the mass of farm people only lightly touched by the higher forces of education, religion, and socialization. To these his sympathies went out, and he proposed for them such means of improving their conditions of living as were already known and at hand. So began the Humanitarian Stage.

Henderson had a student, John Morris Gillette, who had prepared for a clergyman's career by a theological course. In 1901, he received his Ph.D. at the University of Chicago and went to North Dakota, where he joined the faculty of the University as sociologist. In 1913 he put out the first American textbook in rural sociology; entitled *Constructive Rural Sociology*, it has been revised several times since then, and now as simply *Rural Sociology*, it still holds a place in college and high school curricula. Gillette continues the Humanitarian Stage.

Fifty years ago, Josiah Strong, a Congregational clergyman, writer on social welfare and champion of disadvantaged classes, was calling attention to the underprivileged character of rural

life, especially in New England. Among the few people who gave serious heed to his words were a young Iowan, Henry C. Taylor by name, who years ago acknowledged to me his debt to Strong, and a New England clergyman, Wilbert L. Anderson, who in 1906 published *The Country Town*, for which Strong wrote the introduction. This was one of the early books of the Humanitarian Stage.

While Henderson and Small were starting sociology at the University of Chicago, Franklin H. Giddings was beginning his career as a sociologist at Columbia University. He was a son of a New England clergyman, but once in my hearing he announced his religious classification as a "scientific secularist." Warren H. Wilson, a rural clergyman, became a student of Giddings and under him gained his Ph.D. in 1908 with a dissertation on his rural New York parish,—fitting into the closing years of the Humanitarian Stage. I quote from a letter of Wilson's written to me shortly before his death last year: "Dr. Giddings taught me that the church is a sociological institution. I have tried to be an interpreter to religious people of the scientific material which accumulates unused in universities." Wilson, as we shall see, belongs particularly to the next stage, but had the emotional characteristics of the first.

Another of Giddings' students was James Mickel Williams, who prepared for the ministry at Union Theological Seminary in 1901, and gained his doctorate with Giddings in 1906 with a dissertation on his native rural community of Waterville, New York (which, by the way, was the habitat of my father's and mother's families for two generations). Williams ties into both the first and second stages. In 1912, after several years as a rural clergyman, Newell L. Sims gained his Ph.D. under Giddings with a dissertation on a *Hoosier Village*. Here is another humanist who carries the quality of the first stage over into the second and third. His book on *The Elements of Rural Sociology* is one of the most practical texts for students at present.

Butterfield not only belongs to the Humanitarian Stage by character and chronology but, through a constant adjustment of outlook and continuous activity in rural matters, to the second

and third. In fact he shares honors with Henderson as an early thinker on rural-life problems. In 1935, Butterfield wrote me as follows: "I must confess that I am probably not so much a rural sociologist as a ruralist; for my interest in rural affairs has been less with the subject of rural sociology as a special field of research and teaching than with the whole problem of securing an adequate rural civilization as a phase of the total life of society." After 1902 he continued his own courses, as well as others on the rural community and rural organization, in the Massachusetts Agricultural College and the Michigan State College, each of which he served as president.

Thomas Nixon Carver became professor of political economy at Harvard University in 1900. The bent of his mind was sociological as well as economic, and one of his early works was a source book on the progress of sociology. His was the first *Principles of Rural Economics* (1911) to contain a chapter on social life. His close connection with religious organizations and his chronology decide me to place him in the first stage, although he more particularly played a leading rôle in the third stage. George H. Von Tungeln, one of the early trained rural sociologists gained his doctorate with Carver, and was one of the first teachers of rural sociology, serving continuously at the Iowa State College since 1913.

Henry C. Taylor, an instructor in agricultural economics in the College of Agriculture at the University of Wisconsin in 1904, by sympathy with the hard life of farm people as he had known it during his Iowa boyhood and by chronology, probably belongs to the first stage. When I first knew him in 1905, Taylor used to say that it was his youthful observation of the contrast between the life of city and farm families that impelled him to graduate work in order to find out why rural people live under such a heavy handicap. Taylor, the rural economist, never a rural sociologist, is named in this chronicle because of the important rôle he played in the third stage.

Horticulturist, nature poet, and sympathetic interpreter of the farm man in the farmer's world, Bailey comes chronologically in the first stage, but more significantly in the second. While

professor and dean of the New York State College of Agriculture at Cornell University from 1888 to 1913, he was, somewhat casually as if by second nature, giving vent to his love for farm life and the farmer in chapel talks, classes, and articles. He had found a kindred spirit in Butterfield, another young agricultural-college administrator, and they had become, as Bailey recently said, "companions in outlook." These two men were destined to play a great part in the second stage.

I come now to two Irishmen whom I introduce at this point because of their chronology, Sir Horace Plunkett, and his close friend and fellow worker, George William Russell, familiarly known as A. E. Plunkett's ill health, due to a tubercular trouble, brought him early in life to the plains of the American Northwest, where he met Theodore Roosevelt. From this meeting arose a friendship that ripened as Sir Horace took office in Ireland and Roosevelt entered politics in America. Plunkett, who came to believe that cooperation and cooperative association were the panacea for Irish rural ills, assumed the leadership of a movement to revitalize Ireland. Russell, the poet, painter, ruralist, and philosopher of rural life, believed in the renewing, elevating power of large, free, joyous association. He built six community houses of stone in county-seat towns of Ireland as a demonstration of "free joyous association." I visited one of these on the west coast of Ireland a few years ago. It was a beautiful structure and would have cost fifty thousand dollars in the United States. These two men loved the land, loved farming, and loved country life. Let me unroll their influence in the next stage of the development of the science and philosophy of rural society in the United States.

THE CONFERENCE AND SURVEY STAGE

Again for convenience, I call the second stage, the Conference and Survey Stage because conferences and surveys took such high rank as instruments expected to give a sufficient toe-hold leverage on farm conditions to improve them. There was high hope that an all-round view,—a superficial view, mind you, of the whole surface of a given area—a view of the related parts

of a limited portion of rural life, would result in knowledge which could at once be put to use in fundamentally improving it in that area. In this second stage, the humanitarian impulse of the rural humanists was still strong, driving them on toward a goal—good but rather vague.

In 1908, while Theodore Roosevelt was President, Plunkett made one of his frequent visits to America for his health. He recounted to Roosevelt his experiences and achievements in Ireland, and they became a basis for earnest conversation and correspondence. Plunkett handed over to Roosevelt the slogan and program which he and Russell had used in Ireland, "Better farming, better business, better living, but better business first." While I was calling on Russell in Dublin a few years ago, I asked him how "better living" got into the slogan and program. Russell, with a sly twinkle, knowing that in America the slogan in its entirety was credited to Sir Horace, replied: "I suppose it was I that put 'better living' in there." In 1926, Sir Horace and I were in Denmark together. He became much impressed with the impulse that folk schools had given Danish farming, and Karl Walter, his secretary, told me that Sir Horace was ready to reverse his slogan to read "better living first."

The outcome of the conversation between Roosevelt and Plunkett was the famous Roosevelt Country Life Commission, headed by Bailey, then dean at Cornell University. In years gone by, I have talked with Sir Horace about the inception of this Commission, and also with Bailey, who told me that Roosevelt called him to the White House at ten o'clock one night and offered him the chairmanship. Bailey replied: "I accept, Mr. President, providing that you appoint as one member a young man by the name of Kenyon L. Butterfield." So, in 1909, came the report of the Country Life Commission which stirred the press of the United States for several months and became the proclamation of better living on American farms. Plunkett's ideas and experiences gave the impetus to Roosevelt's efforts to spread enthusiasm for a "good kind of life on the farm."

This report, which became the first text of the country-life movement in America, contained three significant recommenda-

tions: conferences, the federation of rural forces, and surveys. Two of these, conferences and surveys, were immediately accepted and put to work. There were country-life conferences at State universities, country-life church conferences, country-life county conferences, and some State commissions on country life appointed by Governors. There were a few small attempts to federate rural forces. It is not too much to say that every articulate member talked himself out at these conferences which swept the land from 1909 to 1918, and the people of city and country came to know the crystallized current notions of the best talkers and writers on rural life.

I do not disparage the contributions of other members of the Commission,—Gifford Pinchot, Henry Wallace, Walter H. Page, W. A. Beard, and C. S. Barrett,—when I name Butterfield as the father of the idea of conferences and federation of rural forces and Bailey as the father of the surveys. Bailey had been making orchard surveys at Cornell. His young man in farm management, George F. Warren, had made the well-known survey reported in *Bulletin 295*, which you will find worn to a frazzle on all agricultural-college library shelves. Bailey himself later put out a notable pamphlet on surveys.

The first man to pick up the idea of surveys was Warren H. Wilson, who was in charge of the rural end of the Home Missions Board of the Presbyterian national office in New York City. Wilson wrote me in 1935 as follows: "My enrollment in this field [*rural work*] was unforeseen. The call came to me in the Country Life Commission Report of Theodore Roosevelt, demanding that churches make surveys and hold conferences for the better living of country people." Wilson's county surveys of the economic, social, and religious forces patently at work in Pennsylvania, Ohio, Indiana, Illinois, and certain Southern States, in their bright-colored covers, were on the shelves of clergymen and teachers everywhere. For five years thereafter Wilson was a much sought-after speaker at the annual agricultural-college farmer round-ups. It is no wonder that later he was attached to the rural staff of Teachers' College at Columbia University for ten years. His writings on the country church

and community, giving weight to social and economic factors, made history over a thirty-year period. Wilson, the humanist, belongs essentially to the Conference and Survey Stage.

Belonging to this same period chronologically is Paul L. Vogt, teacher of rural economics and sociology, author of the second American textbook, *Introduction to Rural Sociology*, and superintendent of the rural work for the Methodist Episcopal Board of Home Missions for several years. His name will be linked with Wilson's by all who knew them.

E. C. Branson began his career as a journalist and later became a teacher in Georgia and North Carolina. As professor of rural social economics at the University of North Carolina he has made a remarkable contribution through his studies of the total social life of rural counties. His method is the survey—elaborated.

At the University of Wisconsin in 1910, Taylor, by that time promoted to professor of agricultural economics, was highly stimulated by the Country Life Commission Report and the two years of publicity of the country-life movement. He decided to put a man on his staff to teach the social aspects of rural life and to apply the principles of research already in vogue in agricultural experiment stations on purely agricultural subjects to the facts of rural community life. After trying out several graduate students by the seminar method with small success, he finally asked Charles J. Galpin, then forty-seven years old, a graduate of Harvard University in philosophy, a student of psychology under William James and Hugo Münsterberg of Harvard, and G. Stanley Hall of Clark University, to become an instructor with him in rural-life problems in 1911. At that time rural conferences and rural surveys were in full swing. J. Clyde Marquis, then college editor at Wisconsin, put on the first Wisconsin rural-life conference, at which Galpin gave a paper on the analysis of the farmers' social contacts in a New York community where he had for ten years been principal of a rural academy, and in 1901 had established the first course in agriculture in a secondary school with a graduate from Bailey's college at Cornell as teacher. The next year, Marquis became editor of the *Country Gentleman*, and Galpin continued the

Wisconsin country-life conferences for five years. Meanwhile, as his contribution to surveys, Galpin perfected a method of making surveys of country school districts; the college printed it in bulletin form and thus stimulated the teachers of rural schools in several entire counties to use their pupils in surveying—counting up—some of the major social facts and items in their districts, which were then summarized by the county superintendent of schools and printed as news in the local papers. The publication of these surveys led, through the spirit of imitation and emulation, to the adoption of many farm-household conveniences in backward counties. Chronologically belonging to the third stage, by contribution to the second, a former student of Galpin, Nat T. Frame, while director of extension in the West Virginia College of Agriculture, made a unique series of survey studies in West Virginia, with his rural community score card.

Within a year, however, it was apparent to Taylor and Galpin that the survey, as then understood and practiced, was an inadequate instrument for investigating country life. It was limited on the whole to a mere aggregation of facts already known and of agencies already in operation, and when the aggregate was totaled, rural society itself still remained an unknown without a science or a philosophy. Taylor and Galpin determined to try out the inductive method of analysis, hoping to discover some of the underlying and interlacing facts of rural life. Thus was initiated the method of research which dominated the third stage.

THE RESEARCH ANALYSIS STAGE

Galpin employed the analytical method of research at the University of Wisconsin from 1912 to 1919, while the survey was gradually proving either unwieldy when it produced too heterogeneous a conglomerate or unfruitful when publicity of its findings failed to inspire emulation. In 1917, the rural section of the American Sociological Society was formed by a small group of a dozen persons including Warren H. Wilson, Paul L. Vogt, and C. J. Galpin. A committee composed of Vogt, Walter J. Campbell, and Galpin was appointed to prepare a plan for analyzing the social aspects of farm tenancy. A plan and

schedule were prepared and printed in the *American Journal of Sociology* in 1918, with the hope that it might be taken up widely and regional studies made. Galpin, however, made the only study according to this plan. It was published under the title, "Farm Tenancy, and Analysis of the Occupancy of 500 Farms," as Wisconsin Agricultural Experiment Station *Research Bulletin* 44. It is apparent from the failure of this first plan to catch fire regionally that analysis of rural life was still feeble.

In 1919, Taylor became chief of the Office of Farm Management in the United States Department of Agriculture. Soon thereafter, at the request of Secretary David F. Houston, a committee composed of rural social workers and students of farm-life problems met in Washington on May 1, 2, and 3, to outline a field of research for a unit of Taylor's office to be called farm-life studies, which later came to be known as the Division of Farm Population and Rural Life. The committee, under the chairmanship of Carver of Harvard, consisted of twenty-eight members, among whom were Mabel Carney, A. C. True, E. C. Branson, Florence E. Ward, C. B. Smith, Dwight Sanderson, George H. Von Tungeln, O. E. Baker, Charles A. Lory, L. C. Gray, Bradford Knapp, H. C. Taylor, G. I. Christie, and C. J. Galpin. The report of this committee met with the hearty approval of Secretary Houston, and was issued by the Office of the Secretary as its *Circular* 139. This eight-page pamphlet has served as the official charter under which the Division of Farm Population and Rural Life has operated for nearly nineteen years. On May 12, 1919, Secretary Houston appointed Galpin as economist in charge of the new unit.

A few of the Carver committee's suggestions are of historical interest: 1, Cooperation with State colleges of agriculture and experiment stations; 2, Cooperation with the Bureau of the Census and other Federal agencies; 3, Cooperation with non-governmental social agencies. The field of research as outlined included the following: rural family and home life; social contacts in typical rural communities; the relation of educational and religious institutions to farm-life problems; problems relating to geographical population groups; rural organizations; social aspects

of farm tenancy and landlordism; various forms of disability among farm people; the social consequences of local disasters due to natural causes; and the social consequences of thrift and thrift agencies.

The budget of the Division began with about \$23,000. The staff comprised four economists, so-called, and three clerks. It sought close cooperation with the State colleges of agriculture, the Bureau of the Census, and the United States Public Health Service, the Extension Service, and various other legalized (permitted as cooperators) social agencies. Following these lines of cooperation, analyses of limited subjects of study were made in State after State, as the colleges of agriculture added men to teach and do research in rural-life problems to their faculties. By actual count, more than one million copies of bulletins printed by the Division have been sent out to farmers and others. The studies printed by agricultural colleges and experiment stations, in addition to these, reaches probably half a million.

That Butterfield kept pace in spirit with the third stage of research is evidenced by the fact that he was one of the ardent sponsors of the Purnell Act of 1925, and himself put in the talismanic word "sociological" as companion to "economic." Besides the older pioneers already mentioned in connection with the first and second stages, a second group of younger men belonging to the third stage should be named as leaders in analytical research: L. L. Bernard and E. L. Morgan at Missouri; Carl C. Taylor at Missouri and North Carolina; J. H. Kolb at Wisconsin; Dwight Sanderson at Cornell; E. L. Morgan at Missouri; W. E. Garnett at Virginia Polytechnic Institute; Wilson Gee at the University of Virginia; Edmund de S. Brunner at the Institute of Social and Religious Research and Columbia; W. H. Fry at the Institute of Social and Religious Research; C. E. Lively at Ohio; B. F. Coen at Colorado; Carle C. Zimmerman at North Carolina, Minnesota, and Harvard; B. L. Melvin at Cornell; E. L. Kirkpatrick in the Division of Farm Population and Rural Life and at Wisconsin; Theodore B. Manny in the Division and at Maryland; C. R. Hoffer at Michigan; and Walter A. Anderson at North Carolina and Cornell. A still younger group of fully

trained rural sociologists, whom we all know and look to with high hope, are now in highly responsible positions in rural-life research and extension service.

Certain administrators of agricultural colleges and the United States Department of Agriculture have, in the third stage, been highly sympathetic to and influential in rural sociological research and extension: A. R. Mann of Cornell; Thomas P. Cooper of Kentucky; J. R. Hutcheson of Virginia; H. C. Ramsower of Ohio; W. C. Coffey of Minnesota; Chris L. Christensen of Wisconsin; E. W. Allen and B. Youngblood of the Office of Experiment Stations; and C. B. Smith of the Extension Service.

In the allied fields of rural education, religion, health, and recreation, are many men and women like Ernest Burnham, Mabel Carney, H. N. Morse, Malcolm Dana, and Bishop O'Hara, whose sociological contributions have been invaluable, throughout the first three stages. Among editors who have taken a lively interest in the progress of rural-life science and who have done their bit through sympathetic publicity, Herbert Quick, Clarence Poe, Dan Wallace, and John Finley should be mentioned.

THE STAGE OF SYNTHESIS AND THEORY

The stage of analysis, while necessary and inevitable, has been recognized for some time as inadequate to a philosophic comprehension of rural society. The great depression has shown us how deep in all affairs of the Nation is the human psychosocial element. Rural society in all its varied social and economic relations and interrelations appears to be, mathematically speaking, a function of psychic and social elements hidden in human nature. The fourth stage, I venture to think, is now set for an understanding of rural culture, broadly, anthropologically interpreted, through synthetic approach to facts and principles of rural life. The roll is now open for candidates as pioneers in rural theory—the fourth stage. I will propose only two for the list: Pitirim Sorokin of Harvard, and Carl C. Taylor of the Division of Farm Population and Rural Life. Sorokin has made a stab at rural theory in the *Systematic Source Book in Rural*

Sociology. Theory, however provocative and controversial and seldom recognized as having more than high plausibility, is important to science. Taylor has for the past two years been thinking and talking "theory." As one pioneer to another, I salute Taylor as the logical leader in and stimulator of rural theory at the opening of the fourth stage in the science and philosophy of rural society.

A neighbor of mine, one of the former wizards in the United States Department of Agriculture who was famous for his knowledge of plant pathology, used to say in his lecture on nematodes, "If the whole earth were destroyed without a trace except its nematodes one could from Mars still make out the earth's original conformation on account of the infinite number of nematodes." I think that Dr. N. A. Cobb, when he looked at the earth, usually saw a world of nematodes. I fancy it is a habit with us all to view professionally the world of our own abstractions. The modern physicist describes a world of speeding electrons and protons; the astronomer, a universe of spiral nebulae; the magnate of industry beholds a world of precise units of labor, output, and transfer to units of money. The rural sociologist by and large sees a world, rural or urban, of persons more or less rational, but emotional. I think that Taylor's theory will never lose sight of rural personalities, however deep it may dip into land, capital, and income.

CHARLES JOSIAH GALPIN

Falls Church, Virginia

THE GYPSUM TRADE OF THE MARITIME PROVINCES ITS RELATION TO AMERICAN DIPLOMACY AND AGRICULTURE IN THE EARLY NINETEENTH CENTURY¹

Gypsum or plaster, as it was commonly called, is still to be found in large quantities along the upper shores of the Bay of Fundy and in the district of Pictou. Deposits of lesser consequence occur in Cape Breton Island. Apart from other chemical attributes which today make it a valuable ally of the cement industry in the United States and Canada, gypsum, because it imbibed moisture readily and resisted weathering, proved to be an unexcelled calcium fertilizer for use in the production of grain in the days before more efficient chemical compounds were available. It proved to be particularly beneficial to wheat, "resisting the extremest heat and length of Summer, and producing abundant crops where and when without it scarce a blade of corn or grass can be reaped."²

After the American Revolution, wheat and flour remained the principal staples of export from the Middle and Southern seaboard States, but much of their land had lost its original fertility, and, without the constant addition of fertilizer, it could hardly have yielded an average crop. Hence, beginning with the latter years of the eighteenth century, gypsum became an essential article of import to those States. Quarried with the aid of gunpowder, the hard dirty-grayish masses of gypsum were broken up and carried in small boats down the rivers and inlets to the American border at Passamaquoddy Bay. There, New England vessels loaded the cargoes, which were ultimately received free of duty in such ports as Boston, New York, Phila-

¹ The author is indebted to the Harvard Committee on Research in the Social Sciences for a grant-in-aid of research in this field.

² Governor Wentworth of Nova Scotia to the Secretary of State, Lord Hobart, June 19, 1802, Public Archives of Nova Scotia, 53:351. Hereafter, cited as P.A.N.S.

delphia, Baltimore, and Charleston. "How many farmers some years ago laughed, when they saw their neighbours putting plaster on their land," declared the *Boston Centinel* in 1820, "and now we see the farmers doubling their crops by using it."³ Certainly, the first two decades of the nineteenth century witnessed a growing dependence of the American grain lands on this staple. "It is necessary to agriculture in the United States in so great a degree," wrote the British consul at Baltimore, "as to make the value of their lands entirely dependent upon it." Without it, he added, the value of the lands in Maryland would sink 50 percent.⁴

This statement was no idle exaggeration. Worth on an average about \$4.00 a ton when first shipped, a price which yielded a liberal profit to the small proprietors who handled it, gypsum was known to rise, on one occasion at least, to as much as \$36.00 a ton in the United States, "proving most decidedly," in the words of an anonymous British traveller, "the diminished fertility of the soil in the United States."⁵ Averaging about 30,000 tons at the beginning of the nineteenth century, the annual import soon climbed to 100,000 tons, and in terms of pounds sterling, it amounted to more than all the rest of the British North American imports combined.⁶

The chief exporting towns of the Maritimes lay at the head of the Bay of Fundy, close to the gypsum quarries, and also, it should be added, to the grindstones that helped to make up the

³ Quoted in the *Acadian Recorder* (Halifax), July 22, 1820.

⁴ William Dawson to Lieutenant-Colonel Hailes, Mar. 10, 1817, Canadian Archives (Ottawa), New Brunswick (ser. A), 26:41. Hereafter, cited as Canad. Arch., N. B.

⁵ A British Traveller, *The Colonial Policy of Great Britain Considered with Relation to her North American Provinces, and West India Possessions*, 93 (Philadelphia, 1816).

⁶ According to figures prepared for Lord Brougham, the exports from the United States to British North America in 1804 amounted to £253,627 and the imports from the latter to £178,135. On the surface, the balance stood in favor of the United States; but gypsum was not taxed and therefore did not appear in the estimates. The addition of gypsum would have left the balance against America. *Speech before the House of Commons, April 1, 1808, in Support of the Petitions from London, Liverpool, and Manchester, against the Orders in Council, 22-23 (Boston, 1808).*

cargoes for the American export trade.⁷ From little villages like Windsor and Westmoreland, small craft, manned chiefly by countrymen who neglected their farms for the more profitable industry, made one or two trips each year to the boundary, returning home laden with teas, coarse cottons, spirits, shoes and boots, and other contraband goods. Usually under 30 tons burden, such vessels could coast along the shores in shallow water eluding the vigilance of the revenue officers, and finally land their illicit cargoes in uninhabited bays and inlets where no custom-houses existed. Small boats then picked up the goods and distributed them through every part of the country, particularly among the populous sections around the Bay of Fundy.

By the end of the eighteenth century, the country around Passamaquoddy Bay had begun to rival Canso as a smuggling center.⁸ The explanation of this shift from the heart of the fishing region to the Bay of Fundy lies in the rapid growth of the traffic in gypsum. In answer to an increasing American demand, a market developed irrespective of trade and navigation laws, and its growth was facilitated by the undefined boundary line between Maine and New Brunswick, and by the presence of strategically situated island depots, whose ownership, as a consequence of their frontier position, was open to question.

Although little more than pawns on the diplomatic board, the disputed islands were, for a time, to play a major rôle in the Maritimes' trade relations. Nominally occupied by the United States, Moose, Dudley, and Frederick became, nevertheless, a sort of no man's land in which neither nation had exclusive rights. As a consequence, they became the retreat of privateers and smugglers, the asylum of deserters from the British Army and Navy, and frequently the home of criminals, absconding debtors, and smugglers from Nova Scotia, New Brunswick, and New England. Their chief significance lay in the fact that

⁷ Most of the grindstones came from the head of the Chignecto Basin and from the district of Pictou.

⁸ See George Leonard, Superintendent of Trade and Fisheries, to John King, Nov. 10, 1800, Canadian Archives, Nova Scotia (ser. A), 132:164. Hereafter, cited as *Canad. Arch.*, N. S.

they were so situated as to become ideal depots for the exchange of gypsum across the indefinite boundary.

The hub of the trade was the British island of Campobello. Its peculiar advantage lay in the fact that it was almost athwart the uncertain border line, and only a narrow sheet of water separated it from Moose Island, which Americans claimed as belonging under the jurisdiction of Massachusetts, and which they had already begun to settle. Situated at the extreme point of Passamaquoddy Bay and about twenty miles from St. Andrews, Moose Island comprised about 2,200 acres and, by 1808, supported over three hundred inhabitants. A customhouse had been opened, large warehouses had been built, and the island possessed an extensive shipping.⁹ This development, as well as that of other border islands in the vicinity, was a direct consequence of their proximity to Campobello, the clearing house for the gypsum trade, where there was no regular customs establishment, merely a deputy, whose broad moral outlook rendered him indifferent to the growth of the illegal trade that was developing rapidly under his very nose. One hundred tons of gypsum were landed at Campobello for export to the United States in 1794, and by 1802, the shipments amounted to about 14,000 tons.¹⁰

Aside from the obvious advantages of exchanging gypsum for cheap contraband goods, the exporter also sought to escape the high tonnage duties, averaging about twelve shillings and sixpence a ton, which were imposed on British vessels entering the United States. It was possible, in the absence of armed patrols, to do this quite boldly, merely by making straight for Moose Island or some adjacent port and there transferring the cargo. However, the majority of the traders, preferring to disguise their enterprise with a thin raiment of legality, entered their vessels at the deputy's office at Campobello, and, on payment of a nominal fee, were permitted to unload. It was assumed that the vessels remained within British waters, and, therefore,

⁹ See Sir George Prevost to E. Cooke, Under Secretary to Lord Castlereagh, Apr. 27, 1808, P.A.N.S., 58(13).

¹⁰ James Hannay, *History of New Brunswick*, 1:293 (St. John, 1909).

they paid no clearance fee. Since the boundary was undefined, it was possible for the British trader to move further into disputed waters and transfer his cargo alongside an American vessel, or, more frequently, in an out-of-the-way harbor of Moose or Dudley. As long as the ownership of the islands remained uncertain, it was impossible to define the legal boundary, and, until after the War of 1812, no attempt was made to correct the situation. Unrestricted export was permitted as there was no law establishing where the cargo should be landed or unloaded.¹¹

Under such circumstances, there could be no rigorous enforcement of the Navigation Act, and since the boundary continued to be sufficiently imaginary and flexible to render prosecutions for trespassing difficult, the British trader found it almost impossible to conduct his business unless he became, according to the letter of the law, a smuggler.¹² The only place for the upright man with ambition, in the opinion of George Leonard, Jr., who undertook to investigate the situation for the Government, lay far away from the temptations of the Bay of Fundy. Even the impecunious settlers nestled around St. Andrews were guilty of "certain dealings" which strongly militated against their claim of being "poor but honest," and there was every reason to believe that collusion frequently existed between the customhouse deputies and the American skippers. This lack of competent supervision encouraged transgressions, already aided and abetted by an elastic boundary line.¹³ Despite its greater length of coast line, New Brunswick had only one customhouse as compared with Nova Scotia's two; yet by the beginning of the

¹¹ Some of the Americans living on the border islands were able to obtain British registers for their vessels in order to enjoy the benefits of trade without any risk of penalties on either side of the boundary. See the correspondence of David Owen, a resident of Campobello, with respect to the illicit trade of the Americans, to the Commissioners of His Majesty's Customs in London, Dec. 29, 1803, and Mar. 30, 1804, *Canad. Arch.*, N. B. (ser. A), 15-2:195.

¹² 7 and 8 William III, cap. 22, sect. 2 ff.

¹³ The trade was also encouraged by small armed vessels from the United States which frequently traversed the mouth of the St. Croix to give protection to the skippers of both nations. See Leonard to the President of His Majesty's Council, Sept. 27, 1806, W. O. Raymond, ed., *Winslow Papers*, 564 (St. John, 1901); also, Prevost to Cooke, May 28, 1808, *P.A.N.S.*, 58(17).

nineteenth century, as a result of the trade in gypsum, it possessed as much trade to and from its ports as the latter Province.¹⁴

From the point of view of British policy, the main damage sustained as a result of this trade came through the loss of the monopoly of transport. In the case of gypsum, it was estimated that the profits of freightage were worth double the value of the article, and according to George Leonard, the Superintendent of Trade and Fisheries, American subjects were thereby able to control nineteen twentieths of the carrying trade from Passamaquoddy Bay.¹⁵ In view of the fact that small craft conducted the bulk of the British trade, this estimated proportion barely exaggerated the real situation. During the summer months, there were almost constantly from fifty to seventy American vessels lying in the Bay waiting to complete their cargoes from the small vessels which came from the quarries. Forty thousand tons of gypsum were mined in New Brunswick and Nova Scotia in 1806, and of this amount, three quarters were carried to market in American instead of British vessels, representing, in the opinion of Nathaniel Atcheson, the provincial agent, a loss of at least 10,000 tons of shipping, navigated by 1,000 men.¹⁶

The task of securing a greater share of the carrying trade, and at the same time, curbing the import traffic in contraband goods, proved to be a complicated business which in the end defied the best efforts of the provincial legislatures as well as the Superintendent for Trade and Fisheries. The British Government gave the matter little concern, and took no energetic steps to support the local governments. As the story of the gypsum trade finally reveals, they were less concerned with a matter of 10,000 or so tons of shipping than with keeping the dubiously

¹⁴ St. John was the chief port of customs of the district of New Brunswick. Besides Fredericton, the capital, there were twelve stations called out-bays in different parts of the Province, where the collector and comptroller placed deputies to act for them. Seven of these were on the coast of the St. Lawrence, and five were so-called boundary stations on the Bay of Fundy.

¹⁵ Letter to the President of His Majesty's Council, Sept. 27, 1806, *Winslow Papers*, 564.

¹⁶ *American Encroachments on British Rights*, 49 (London, 1808).

legal transactions on the water boundary out of the diplomatic arena. After the renewal of the war with France in 1803, the growing irritation of the United States against British claims to right of search made the British Government less anxious to provoke the great neutral whose expanding market they cherished,—the more so in view of the fact that their own surplus shipping was hardly sufficient to undertake the extra responsibilities of the gypsum trade.

At the same time, in following this policy of non-interference, the British officials did not see eye to eye with the provincial legislatures; and there arises the curious case of the colonial assemblies urging the full enforcement of the navigation laws in the interest of colonial shipbuilding and provincial revenue, and the Mother Country taking a position of indifference, if not of plain opposition, to a policy of forceful regulation. "We want to be regulated," declared Atcheson on behalf of the Nova Scotia merchants, "and nothing is so Hostile to Trade & Agriculture as a fluctuating policy."¹⁷ Under the circumstances, it was finally left to the colonies to take unified measures on their own account. Unless, however, the two major Provinces could agree on a common policy, any regulation was almost sure to be ineffective, and in the beginning, such harmony of purpose did not exist.

In 1803, acting on the recommendation of Leonard, the New Brunswick Assembly moved for an act of the British Parliament, forbidding reshipment of gypsum in any British port, save in British vessels, or to the United States, anywhere north or east of Portland, Maine. This measure, declared Lieutenant Governor Carleton, coupled with the establishment of a customhouse in Campobello, would be "the only means by which . . . the local facilities of illicit traffic in that frontier can be prevented."¹⁸ This resolution, if acted upon, would have confined the exports to larger vessels capable of making a long sea voyage; it would have meant additional freight, more tonnage, and more men employed. On the other hand, it would have spelt the end of

¹⁷ Extract of a letter, Nov. 12, 1815, P.A.N.S., 305(111).

¹⁸ Carleton to Hobart, Mar. 23, 1803, *Canad. Arch.*, N. B. (ser. A), 15:7.

the trade, both legal and illegal, so far as the small farmer was concerned; and in the opinion of Governor Wentworth of Nova Scotia, who presented his views before the British Secretary of State, the anticipated advantages would by no means compensate for the disfranchising of the smaller vessels. People who owned plaster quarries on creeks and inlets where only small vessels could load would be deprived of the sale of their property, since small quantities could hardly repay reloading into larger vessels.¹⁹ As for the smuggling evil which the measure was primarily aimed to check, Wentworth refused to believe that its existence threatened the prosperity of either Province. "Upon calculating the imports in small vessels, the value in Corn, Flour and provisions and other legally imported articles necessary for this country, it appears that a very insignificant trifling amount remains to be applied to the purpose of contraband importation.—Much too little to recommend any immediate Parliamentary intervention."²⁰

Whether or not Lord Hobart was influenced by Wentworth's specious arguments is doubtful; but the fact remains that the proposal to check the American shipping monopoly was not even discussed, and the Board of Customs reported on March 28, 1805, against the establishment of a separate customhouse at Campobello, on the ground that the extent of the trade did not justify the expense, "a preventive officer under the supervision of Mr. Leonard and his deputy being in our opinion fully adequate to the prevention of irregularities therein."²¹ Such a stand, buttressed as it may have been by the assertions of Governor Wentworth, ran directly contrary to the evidence. There may have been a certain amount of alarmist propaganda about

¹⁹ In opposition to this view, it was subsequently urged that the ousting of small craft would provide additional employment for larger vessels which were being built in Nova Scotia, and secondly would compel the owners of the small vessels to embark in the fisheries. Lewis Wilkins, speaker of the Nova Scotia Assembly to the speaker of the Assembly of New Brunswick, P.A.N.S., 305(57).

²⁰ Wentworth to Hobart, May 10, 1803, *Canad. Arch.*, N. S. (ser. A), 136:32; P.A.N.S., 53:423.

²¹ Report of the Board of Customs on the proceedings to be taken to prevent illicit trade in North America, *Canad. Arch.*, N. S. (ser. A), 15-2:296.

some of the appeals from the Superintendent of Trade and Fisheries, but no sensible person could deny the fact that a tide of manufactured goods was steadily rolling in from the United States. Wentworth may have been justified in saying that such a traffic indirectly benefited the hewer of plaster and grindstones, but the position of the "fair trader" in both Provinces was seriously jeopardized. "This trade you no doubt heard spoken of as an advantageous one for the Province," wrote William Goodall; on the other hand, "Unless some steps are taken to prevent the smuggling trade from the American states, we shall soon be without a customer for the principal part of the Articles that we deal in."²²

Not until 1807 did the Board of Trade approve the plan for a customhouse at Campobello,²³ and only after much hesitation did it approve an act of the New Brunswick legislature, which, although little more than a gesture, aimed to curb the illicit trade by imposing a high duty on articles illegally brought into the Province, "to be levied and paid after the condemnation and sale thereof."²⁴ The Board of Trade may have regretted the fact that the Americans took the larger share of the carriage; at the same time, they rightly feared that any attempt to confine the trade strictly to British ships would lead to retaliation.²⁵ For the same reason, they refused to consider the colonial demands that Great Britain reclaim the islands of Moose, Dudley, and Frederick from the jurisdiction of Massachusetts and definitely end the smuggling.²⁶ A dramatic illustration of this policy of laissez faire revealed itself in the early summer of 1806. On Leonard's orders, an American sloop, the *Falmouth*, was seized and later condemned by the Vice Admiralty of New Brunswick, for being employed contrary to law in the gypsum trade. The judgment clearly involved the ownership of the islands in the neighborhood of which the vessel was operating.

²² To Nathaniel Atcheson, Dec. 27, 1810, Board of Trade (ser. 1), vol. 54.

²³ Board of Trade (ser. 5), 17:175.

²⁴ Canad. Arch., N. B. (ser. A), 16-2:449.

²⁵ See Minutes, Aug. 28, 1812, Canad. Arch., N. S. (ser. A), 156-192.

²⁶ Canad. Arch., N. B. (ser. A), 16:61; also petition of David Owen to the Prince Regent, June 4, 1812, Canad. Arch., N. B. (ser. A), 21:114.

The American customs authorities reported the incident to Washington; Albert Gallatin, Secretary of the Treasury, laid the matter before President Jefferson, and it was subsequently discussed by Gallatin and the British ambassador. In the end, the former wrote to the lieutenant governor of New Brunswick recommending that the mode hitherto adopted for loading vessels and the use of the waters in Passamaquoddy Bay might be continued, and he expressed the hope that American vessels would "experience no further interruption."²⁷

It was obvious, therefore, that the British Government had no immediate intention of interfering with the normal course of the gypsum trade, and if any steps were to be taken, the responsibility must rest on the provincial governments concerned. In 1810, the Assembly of New Brunswick passed a resolution in favor of joint action with Nova Scotia for the imposition of an export duty.²⁸ Such action reveals the determination of the Provincial Assembly to proceed on its own account; but it was apparent to many people that such a course was likely to encourage rather than check the smuggling traffic. For this reason, and because of unsettled relations with the United States prior to the outbreak of the war, no definite steps were taken, and the question was allowed to drop.²⁹

With the beginning of hostilities in 1812, smuggling lost for the time being its iniquitous reputation, so far as the authorities were concerned, and acquired a certain patriotic glamour. In the interests of imperial welfare, it became a question of retaining, by any means, as much of the American trade as possible. For that reason, a blanket order was given to the governors of Nova Scotia and New Brunswick permitting them to grant licenses for the export of gypsum to the United States, as was done in the case of the enumerated articles under the act of 1809.³⁰

²⁷ Leonard to the president of His Majesty's Council, Sept. 27, 1806, *Canad. Arch.*, N. B. (ser. A), 16-2:340; *Winslow Papers*, 564.

²⁸ Mar. 13, 1810, P.A.N.S., 304(1); also 305(111).

²⁹ P.A.N.S., 304(19) and 304(52).

³⁰ Order of July 15, 1813, Privy Council (ser. 2), 194:511-512. The order was transmitted to the secretary of state's chief clerk, Henry Goulburn, on July 21, 1813. Privy Council (ser. 2), 195:57; also Sherbrooke to Bathurst, Sept. 22, 1813, Governor's Letter Book, P.A.N.S., 3:56.

With the end of the war, the possibility of an export duty on gypsum was revived. The national animus which had been generated by more than two years of strife encouraged colonial audacity, and it is reasonable to believe that a certain amount of *revanche* feeling influenced the minds of the local legislators in their dealings with the late enemy. Most men were convinced that America could be made to pay any duty which the Provinces chose to impose, and that, as a result of post-war antagonism, the Mother Country would support them. Nova Scotia led the way with a five-shilling tax on export, and at the same time, forbade reshipment east of Boston.³¹ However, the duty was slight, the cargoes were still subject to American tonnage duties, and New Brunswick did not cooperate. These factors, together with the tremendous post-war demand for gypsum which put a premium on smuggling, made any substantial alteration in the routine character of the trade impossible. The Nova Scotia act of 1815 was a mild experiment which utterly failed of its objective. In the following year, it was repeated, but with a united front.

In March of 1816, Nova Scotia and New Brunswick passed acts which were identical in all respects; both were to go into effect simultaneously and operate for five years.³² The declared object was to secure the carriage of plaster of paris to the United States in British vessels at the expense of New England shipping, by making it unlawful to land the plaster at any port in the United States east of Boston, or anywhere within the limits of the Provinces except at certain enumerated ports. The Board of Trade hesitated; none of its members could have anticipated the reaction which the measure was to provoke in the United States, but they may have foreseen the possibility of international complications. With the problem of the West Indies trade still unsolved, it must have been with considerable regret that they bowed to colonial demands and faced the prospect of another

³¹ P.A.N.S., 305(57).

³² See Sherbrooke to Bathurst, Mar. 21, 1816, Canad. Arch., N.S. (ser. A), 156:12; same (in abstract) in Board of Trade (ser. 1), vol. 104; also Smyth to Bathurst, Apr. 8, 1816, Canad. Arch., N. B. (ser. A), 25:20.

diplomatic entanglement. "As the Acts in question appear to be considered as of great Importance to the commercial Interests of those Provinces their Lordships do not think it would be adviseable that the Royal Assent to them should be withheld, although the Restrictions which they impose are carried to a greater extent than was contemplated by this Committee at the time when they had the Subject previously under their Consideration."³³ As a consequence of this unwilling decision, both acts received royal sanction,³⁴ and the requisite proclamations for giving effect to the laws were published in the provinces before the end of February 1817.³⁵

In the meantime, an angry agitation developed in the North Atlantic States against the "Odious Tax." The new measure was particularly obnoxious to the New Englanders, who saw their trade placed under restrictions from which the Southern States were exempt. To them the scheme was an invidious stroke against a section which, during the late hostilities, had gone "to the extent of her constitutional power to evince her repugnance to the war and her amicable sentiments toward Great Britain."³⁶ At a time when public opinion in the United States was already aggravated by the insistence of the British Government on enforcing its old colonial trade monopoly, and when Congress was considering stinging measures of retaliation, this last provocation could hardly be received in a spirit of dignified forbearance. On March 3, 1817, an act was passed prohibiting, after July 4, the importation of plaster of paris into any port of the United States from any country from which it could not be brought by vessels of the United States. The act was to remain in force for five years, as from January 1, of the same year; but if the foreign restrictions should at any time

³³ Minutes of May 17, 1816, Board of Trade (ser. 5), 24:498-499.

³⁴ Orders in Council of May 23, 1816, Privy Council (ser. 2), 197:199-200.

³⁵ See Hailes to Bathurst, Feb. 3, 1817, *Canad. Arch.*, N. B. (ser. A), 26:4; *Acadian Recorder*, containing the Nova Scotia proclamation, Feb. 22, 1817; see also Bathurst to Dalhousie, Mar. 12, 1817, Colonial Office, 218, 29:176; and P.A.N.S., 63(50).

³⁶ Richard Cunningham to Sherbrooke, n.d., 1816, P.A.N.S., 289(2).

be dropped, the President was given power to rescind the prohibitions by proclamation.³⁷

The Board of Trade received the news of the American interdict in its usual self-possessed manner, although it is apparent from the correspondence that they were anxious for some sort of modification of the colonial acts which might tend to mollify the Republic. As the law stood, American vessels were eligible to carry the plaster, so long as they guaranteed that the cargo would be landed south of Boston. This meant in essence that the trade was being transferred from the more northerly States to Baltimore and its neighbors. They were injuring, so Bathurst wrote to Lord Dalhousie, that portion of the United States disposed to be friendly to Great Britain, rather than benefiting the trade of the Maritime Provinces.³⁸

In the face of the American embargo, the colonial acts did little to increase the proportion of British shipping engaged in the plaster trade, and they were a failure in so far as curbing the smuggling traffic was concerned. In the beginning, as a result of the American counter-measure, the price of gypsum jumped from \$8.00 to \$13.00 a ton. No more welcome contribution could have been made towards the welfare of the smuggler. The New Brunswick law had unfortunately named St. Andrews as a port of export, and from this Passamaquoddy base the illicit trade was carried on with inspired vigor.³⁹ The best evidence of the smugglers' efficiency lies in the fact that the price soon dropped from \$13.00 to about \$7.50 a ton.⁴⁰ The

³⁷ See *Canad. Arch.*, N. S. (ser. A), 158:35.

³⁸ Sept. 5, 1817, Colonial Office, 218, 29:193.

³⁹ According to New Brunswick papers, St. Andrews had become "the centre of an American conspiracy" to evade the local law, and to bring the public authority into contempt. Instead of the inhabitants aiding the revenue officer of that port in detecting and preventing the smuggling of plaster, all assistance was denied him, with the result "that he dare not go in the night to prevent its being taken away; and even in the day time the smugglers set him and his authority at defiance." According to one report, the officer's boat was taken from him and used to carry plaster to American vessels anchored off the islands. *Halifax Chronicle*, July 18, 1817.

⁴⁰ See Dawson to Hailes, Mar. 10, 1817, *Canad. Arch.*, N. B. (ser. A), 26:41.

traffic seems to have been ignored by the customs officials of both nations; and the nonchalant attitude of the deputies at this period indicates that their superiors showed no great anxiety over a business which was still carried on in the time-honored manner at Campobello.⁴¹

Meanwhile, within the two Provinces, some were for surrender; while others, like Treasurer Wallace of Nova Scotia, were for fighting it out on the ground that the American Government would soon be forced to capitulate.⁴² At the moment commerce was at a standstill, and the only hope of clearing up the local deadlock seemed to be, as Chief Justice Blowers suggested, to submit the matter to the decision of the Home Government.⁴³

In the first session of 1818, Lord Dalhousie repealed the Nova Scotia act, and in so doing, he was merely anticipating the instructions that the British Government had already forwarded to him. The British Ministry had settled on a "free port" scheme, which, in that same year, was to permit direct intercourse between specified ports in Nova Scotia and New Brunswick and the United States.⁴⁴ It was highly necessary, therefore, that the colonial laws of 1816 should be repealed before the new system was put into effect. This was accomplished in the spring of 1818, and the repeal automatically brought an end to the American embargo.

In view of the formidable weight of Colonial Office correspondence on this issue, it would be a simple matter to exaggerate the importance of the gypsum trade. After all, the international quarrel which it precipitated was but a short-lived tempest in a teapot,—an *incident* as compared with the long-drawn struggle over the British West Indies trade monopoly. At the same time, it serves to re-emphasize the fact that the American sectionalism

⁴¹ See extract of a letter from Lieutenant-Colonel Coffin of the New Brunswick Council to Thomas Bonnor, provincial agent, Sept. 26, 1817, *Canad. Arch.*, N. B. (ser. A), 26:87; also Chief Justice Blowers to Dalhousie, Nov. 4, 1817, 157:119.

⁴² Letter to Dalhousie, Nov. 11, 1817, *Canad. Arch.*, N. S. (ser. A), 157:119; P.A.N.S., 228(64).

⁴³ Nov. 11, 1817, *Canad. Arch.*, N. S. (ser. A), 157:117.

⁴⁴ See Thomas Lack to Goulburn, Feb. 18, 1818, *Canad. Arch.*, N. S. (ser. A), 159:208.

of old colonial days still survived; in other words, that divergency of interests which for more than a century had separated the New England of commerce and ships from the agricultural Southern and Middle States persisted. With the end of the Napoleonic wars, the situation altered slowly in one vital respect. The retreat of grain farming from the seaboard areas, the expansion of the cotton industry in the South, and more important, the discovery of calcium deposits in Ohio and Michigan and their exploitation in combination with carbonates, phosphates, and nitrates, foreshadowed the decline of the Maritimes' trade in gypsum. By the end of the 1820's, it had almost ceased to exist.⁴⁵ Yet, for more than a quarter of a century after the American Revolution, Nova Scotia and New Brunswick had remained more than economic outposts of a New England which helped to feed them; they were attached by a simple but none the less sturdy tie, to the Southern and Middle States, the fruitfulness of whose lands depended so heavily on a regular supply of cheap fertilizing agents. It is interesting to observe that more than a hundred years later this short-lived but historic connection with these Atlantic States still survives in the Gypsum Packet Company, whose owners continue to run a freight and passenger service between Boston, New York, and Philadelphia, and Windsor, Nova Scotia.

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⁴⁵ Joseph Bouchette, *British Dominions in North America*, 2:152 (London, 1832).

TURNIPS AND ROMANTICISM¹

THE THESIS

The portion of eighteenth century Romantic thought which glorified nature and the country, deprecated civilization and the city, and, upon the implications of these basic formulae, developed elaborate theories of art and morals and of economics and politics, was influenced to a significant degree by the preceding and accompanying enthusiasm for agriculture, and was rooted in part in those complex phenomena usually called the commercialization of agriculture. Professor N. S. B. Gras has called attention to the prevalence of rural themes in English literature during the later eighteenth century, noting that "Agriculture was not content with gaining a literature of its own: it might almost be thought of as setting out to conquer the literature of England;" and after mentioning a few of the best known instances of literary treatment of rural themes, has concluded, "Thus do letters reflect the economic system of the times and in some measure are to be interpreted economically."² Daniel Mornet, whose studies of eighteenth-century French thought are notable for both breadth and thoroughness, pointed out thirty years ago that Rousseau's love of nature and the country had been anticipated by a long series of similar expressions.³ This paper is devoted to the confirmation and explanation of this suspected relationship between agricultural developments and intellectual currents.

¹ This article was presented in part at the joint session of the Agricultural History Society with the American Historical Association at Philadelphia on Dec. 29, 1937. It is a summary of the author's doctoral dissertation with the same title at the University of Minnesota in 1938.

² *A History of Agriculture in Europe and America*, 237 (New York, 1925).

³ *Le sentiment de la nature en France de J.-J. Rousseau à Bernardin de Saint-Pierre*, 15-41, 108 ff., 448, *passim* (Paris, 1907).

THE PRAISE OF HUSBANDRY

From the earliest times the literature of agriculture has been characterized by its own peculiar philosophy.⁴ In effect, it constituted an apology for and a defense of country life. It borrowed from the Golden Age legend and from the widely diffused primitivistic ideas of antiquity to make the assumption that evil, vice, and corruption are the product of cities and of urban civilization.⁵ From this premise it proceeded to the contention that the country is the unique abode of purity, virility, and virtue. Although some of the most famous expressions of this philosophy came from great lords who probably never touched a plow, spade, or pruning hook, and who surely never worked them, there was almost invariably an emphasized exaltation of both the supreme felicity and the noble virtues of the simple husbandman who labored his few acres in the sweat of his brow, and lived chastely, humbly, and happily in an unpretentious cottage. The country was also the source of all good civic and military qualities and the native home of liberty and democracy. Very generally, too, the great heroes of the past were represented as husbandmen or as great lovers of agriculture. Cincinnatus was the greatest hero in agricultural literature, and the Persian king Cyrus became more gardener than ruler except in so far as emphasis on royal rank dignified horticultural employments. Agriculture was regularly described as the only essential employment of man, the basis of all prosperity, the first source of all the arts, and the foster mother of mankind. In antiquity, these ideas were variously developed and emphasized in the agricultural writings of Hesiod, Xenophon, Plato, Aristotle, Cato, Varro, Cicero, Virgil, Horace, Columella, Pliny, and others.⁶

⁴ See the author's summary sketch, "In Praise of Husbandry," in *Agricultural History*, 11:80-95 (April 1937); W. E. Heitland, *Agricola*, 16-130 (Cambridge, 1921); and P. A. Sorokin, C. C. Zimmerman, and C. J. Galpin, eds., *A Systematic Source Book in Rural Sociology*, 1:3-146 (Minneapolis, 1930).

⁵ Cf. Arthur O. Lovejoy and George Boas, *Primitivism and Related Ideas in Antiquity* (Baltimore, 1935).

⁶ A. W. Mair, tr., *Hesiod, the Poems and Fragments*, "Works and Days," 1-30 (Oxford, 1908); H. G. Dakyns, tr., *The Works of Xenophon*, "The Economist," 3(1):213-224 (London, 1897); Benjamin Jowett, tr., *The Dialogues of Plato*, 2:377;

When a modern European literature of agriculture began to develop during the sixteenth century, the classic apologetics of husbandry and country life were taken over bodily by the agricultural writers of the Renaissance. The intervening ages had been almost a void so far as agricultural writing was concerned,⁷ and the Renaissance developed its agricultural literature directly from classic roots. The only major change in the classic praise of husbandry was the inclusion of Christian legend and dicta to reinforce pagan authority. The Old and New Testaments, and later hagiography as well, were ransacked for incidents and teachings to support antique contentions. Agricultural writers thus found evidence that husbandmen were divinely blessed by revealed religion and that God disclosed His majesty in the workings of nature. Thus the immemorial banner and device of agriculture—the exaltation of the country and vilification of the city—drew support from both pagan and Christian lore.

There was a great deal of writing on agriculture in the sixteenth century, and most of the important extant treatises carry full statements of the traditional praise of husbandry. The Spaniard, Gabriel Alonso de Herrera, repeated all the classic formulae in his praises of the farmer's "sacred way of life."⁸ The Italians, Agostino Gallo, Camillo Tarello, and Giovan Maria Bonard, told the old story of humble rural virtue and haughty

3:391-392, 678-682, 695, 701; 4:421-423; 5:742 ff.; 10:595-597 (New York and London, 1892); J. A. Smith and W. D. Ross, trs., *The Works of Aristotle*, "Oeconomica," 10(i):1343, (iv):1318-1319 (Oxford, 1921); Ernest Brehaut, tr., *Cato the Censor on Farming*, 1-2 (New York, 1933); Lloyd Storr-Best, tr., *Varro on Farming*, xx, 121-122, 239, 241 (London, 1912); E. S. Shuckburgh, tr., *Two Essays on Old Age & Friendship*, translated from the Latin of Cicero, 75-86 (London, 1927); Virgil's second *Georgic*; J. C. Elgood, *The Works of Horace*, Epode 2, "Country Life," p. 111-113, Epistles, book 1, ch. 10, "To Fuscus Aristius," p. 252-254 (London, 1893); Columella, *De Re Rustica*, "Preface to Publius Silvinus;" Philemon Holland, tr., *The Historie of the World* (Pliny), 1(17): 550-556 (London, 1601). Similar sentiments may also be found in Sallust, Palladius, Musonius, Dion Chrysostom, Juvenal, Apuleius, and Libanius.

⁷ Cf. Eileen Power, "On the Need for a New Edition of Walter of Henley," Royal Historical Society, *Transactions* (ser. 4), 17:102-103 (1934).

⁸ *Libro de Agricultura* . . . , "Prologo" (Alcalá ed., 1539).

urban corruption.⁹ The same moral, usually heavily emphasized, appeared throughout the innumerable editions of the *Maison rustique* of Charles Estienne and Jean Liébault, and the famous *Théâtre d'agriculture* of Olivier de Serres.¹⁰ The German, Conrad Heresbach, whose treatise was first published in Latin in 1570, expressed the conventional praises of husbandry.¹¹ The *Maison rustique* was made available to German readers by Melchior Sebizius who included a German translation of Horace's ode on country life as well as another poem, apparently original, expressing identical sentiments.¹² During the century, there were many editions in the major European languages of a book on husbandry, supposedly compiled by the Emperor Constantine, which reiterated the classic apology for the simple country life.¹³

In England the conventionalized praise of husbandry was first disseminated by translations of foreign treatises and later expressed in detail in numerous native works on gardening and general agriculture.¹⁴ During the Civil War, the theme was

⁹ Gallo, *Le Vinti Giornate dell' Agricoltura e de piaceri della Villa*, "Proemio," 339-354, 365, [383]-402 (Venice, 1578); Tarello, *Ricordo d'Agricoltura*, "Canzone in Lode dell' Agricoltura," 3, 3 verso, 4, *passim* (Venice, 1567); Bonardo, *Le Richezze dell' Agricoltura*, dedication (Venice, 1586).

¹⁰ For instance, in edition 12 (Paris, 1572) of the *Maison rustique*, see the "Épître dédicatoire," or the "Avertissement au lecteur" in the 1602 (Paris) edition by F. Anthoine Langvior. Concerning the hundred and more known editions of this work, see L. Bouchard-Huzard, *Essai sur les différentes éditions de la maison rustique* (Paris, 1866), cited in Georges Gibault, "Étude sur la bibliographie et la littérature horticoles anciennes," *Journal de la Société Nationale d'Horticulture de France* (ser. 4), 6:720 (1905); *Théâtre d'agriculture*, "Préface," "Conclusion," and 998-1002 (Paris, 1600).

¹¹ Barnabe Googe, tr. and ed., *Four Bookes of Husbandry*, collected by M. Conradus Heresbachius . . . , 1-7 (London, 1577).

¹² *Fuenffzehen Buecher vom Feldbaw*, "Vorrede" (Strassburg, 1579).

¹³ See, for instance, *Der veldtbaw od' das buch von der veld arbeyt in dem all notwendigen stuck . . . Alles vor tausend jaren von dem Keyser Constantino . . . beschrieben: Und jetzt newlich durch D. Michael Herren auss der Kriesschischen in Teutsche sprache vertolmetscht* (Strassburg, 1545), and *Les XX liures de Constantin Cesar, ausquels sont traictez les bons enseignements d'agriculture: traduicts en François par M. Anthoine Pierre* (Paris, 1550).

¹⁴ See Richard Surfleet's translations of numerous editions of the *Maison rustique*, *passim*, re-edited and augmented by Gervase Markham (London, 1616); and Googe, *Four Bookes of Husbandry*, 1-7. Some verses of Thomas Tusser's "The

developed in a number of writings, and it became even more pronounced after the Restoration.¹⁵ In his essay, "Of Agriculture," the poet, Abraham Cowley, compiled one of the fullest and most graceful statements of the agrarian philosophy made during that age.¹⁶ Sir William Temple employed the traditional praise of husbandry to describe gardening, but followed current fashionable opinion in withholding its application from ignoble agriculture.¹⁷

In seventeenth-century France, the agrarian philosophy was

Praise of Husbandry" express sentiments closely akin to the usual apologetics of agriculture, but differ so greatly in form and structure of thought that it would be difficult to establish a generic relationship. For the best edition of Tusser, see *His Good Points of Husbandry*, edited by Dorothy Hartley (London, 1931). The dedicatory material of Thomas Hill, *Profitable Art of Gardening* (ed. 3, London, 1579), is one of the first English examples of the traditional agrarian philosophy. For the early Stuart period, see William Lawson, *A New Orchard and Garden*, "The Preface to all well minded," and p. 53-54 (London, 1623); Charles Butler, *The Feminine Monarchie, or the Histori of Bees*, the end of ch. 1, the translations of the poems by DuBartas, and the poem by George Wither at the head of the text (Oxford, 1634).

¹⁵ Sir Richard Weston, *A Treatise Concerning the Husbandry and Natural History of England* (first written about 1645 and better known as *A Discours of Husbandrie used in Brabant and Flanders*), 108 (London, 1742); Wa[lter] Blith, *The English Improver Improved*, 3-5 (ed. 3, London, 1653); Samuel Hartlib, *The Reformfd [sic] Husbandman*, "Preface to the Reader" (London, 1651), *An Essay for Advancement of Husbandry-Learning*, "Preface to the Reader," 2, 6, 9 (London, 1651), and Hartlib's dedicatory letter to the 1650 and 1654 editions of Weston's *Discours of Husbandrie used in Brabant and Flanders*; Adolphus Speed, *Adam out of Eden*, "To the Reader" (London, 1659); John Evelyn, *Sylva*, "To the Reader" (London, 1664), *Kalendarium Hortense*, 55 (London, 1664), and *Acetaria*, "Dedication," "Preface," *passim* (London, 1699); John Worlidge, *Systema Agriculturae*, "To the Gentry and Yeomanry of England," and "Prooemium in laudem Agriculturae" (London, 1669), and *Vinetum Britannicum; or a Treatise of Cider*, "Preface," 193-194 (ed. 2, London, 1678); Moses Cook, *The Manner of Raising, Ordering, and Improving Forest and Fruit-Trees*, "Epistle Dedicatory," "To The Courteous Reader," 52, *passim* (London, 1679); Leonard Meager, *The New Art of Gardening*, "Preface to the Reader," 2, *passim* (ed. 2, London, 1738), and *The Mystery of Husbandry*, 1 (London, 1697). Cf. Blith, *English Improver Improved*, 3-6.

¹⁶ Abraham Cowley, *Works*, 2:704-715 (ed. 10, London, 1710). Cowley expressed the same theme on many other occasions. See "To Mr. Hobs," "The Country Mouse," "The Garden," the essay "Of Solitude," and the opening passage of the fourth book of his Latin poem *Plantarum*.

¹⁷ *The Works of Sir William Temple, Bart.*, 3:202-245, especially 205-206, 214 (London, 1814).

mincingly perpetuated in books on gardening. There was very little new literature on agriculture, but many of the masters of parterres, orangeries, and box hedges wrote horticultural manuals, and appropriated to gardening employments the glory of King Cyrus, the nobility of Cincinnatus, and all the virtues immemorably attributed to simple tillers of the soil.¹⁸ Literary interest in agriculture began to stir again in France around the turn of the century and slowly increased during the next fifty years. The Jesuit Jacques Vanière published the first part of his Latin poem, *Praedium Rusticum*, in 1692, yet though he added to this *Georgic* imitation from time to time, there seems to have been no complete published French translation until 1755.¹⁹ It afforded a very complete statement of the virtues of country life, set forth as usual in contrast with the decadence of urban civilization.²⁰ Louis Liger, who became one of the most prolific of all French writers on rural subjects, first published his imitation of the old *Maison rustique* in 1700, and the chapter on the "Utilité & délices de l'agriculture" reiterated the familiar details of the dignity of rural life.²¹ Other popular treatments on agriculture and gardening also repeated the traditional praises of husbandry.²² The article on agriculture in the *Encyclopédie* began with a long recitation of the agrarian creed, and the *Journal économique* repeated it in almost every issue.²³ The Physiocrats and others

¹⁸ [Robert Arnauld d'Andilly] *Le Gendre, curé d'Henonville, La manière de cultiver les arbres fruitiers*, preface (ed. 4, Lyon, 1664); Jean de la Quintinye, *Instructions pour les jardins fruitiers et potagers, avec un traité des orangers, suivy de quelques réflexions sur l'agriculture*, v. 1, dedication, preface, 7, 12, *passim* (Paris, 1690).

¹⁹ A French translation appeared serially in the *Journal économique*, beginning in January 1755.

²⁰ *Ibid.*, February 1755, p. 82-120.

²¹ *La Nouvelle maison rustique* . . . , 1:1 ff. (ed. 10, Paris, 1772).

²² [François Gentil], *Le jardinier solitaire*, preface (Paris, 1704); Pierre le Lorrain Vallemont, *Curiositez de la nature et de l'art sur la végétation; ou l'agriculture, et le jardinage dans leur perfection*, 1-34 (Paris, 1711); Noël-Antoine Pluche, *Le Spectacle de la Nature; or Nature Display'd*, 2:28, 88-91, *passim* (ed. 3, London, 1740).

²³ See especially the editorial statement in *Journal économique*, January 1751, p. 6-7.

perpetuated it in the flood of agricultural literature that came after 1756.²⁴

German agricultural literature, though more retarded in development than English and French, was equally devoted to the old agrarian philosophy. Conventional expressions of it are to be found in the works of Agricola, Bilderbeck, Stockmann, and von Eckhart.²⁵

Beginning early in the eighteenth century, the volume of agricultural literature published in English increased greatly, and almost all of the numerous books carried some expressions of the old agrarian philosophy, with varying prominence and emphasis but with an essential character always the same.²⁶

²⁴ Victor de Riquetti, Marquis de Mirabeau, *L'Ami des hommes, ou traité de la population*, 1:60 ff., *passim* (The Hague, 1758); [L. B. Desplaces, ed.], *Histoire de l'agriculture ancienne, extraite de l'histoire naturelle de Pline*, xiii-xvi (Paris, 1765); Saboureux de la Bonnetrie, *Traduction d'anciens ouvrages latins relatifs à l'agriculture et à la médecine vétérinaire*, 1:iv-ix (Paris, 1771); Louis Étienne Arcère, *De l'état de l'agriculture chez les Romains*, *passim* (Paris, 1777).

²⁵ G. A. Agricola, *Neu- und nie erhoerter doch in der Natur und Vernunft wohlgegruendeter Versuch der Universal Vermehrung aller Baeume, Standen, und Blumen-Bewaechse*, "Vorrede," "Vorbericht," "Consolation-Schreiben," *passim* (Regensburg, 1716); S. L. Bilderbeck, *Entdeckte Grufft natürlicher Geheimnisse*, "Vorrede" (Lauenburg, 1710); C. A. Stockmann's "Vorrede" to Ambrosius Zeigern, ed., *Vernünfftige Anleitung zur Oeconomie und Kunstmässige Verbesserung des Feld-Baues* (Leipzig, 1749); L. J. D. Suckow, ed., *Herrn Johann Gottlieb von Eckharts Experimental-Oekonomie über das animalische, vegetabilische, und mineralische Reich, oder Anleitung zur Haushaltungs-Kunst*, ix-xi (Leipzig, 1782).

²⁶ John Mortimer, *The Whole Art of Husbandry*, A2-A3 (London, 1707); Edward Lisle, *Observations in Husbandry*, 1:xi-xvi (London, 1757); John Laurence, *The Clergy-man's Recreation*, preface (ed. 5, London, 1717), *The Gentleman's Recreation*, preface (ed. 2, London, 1717), and *A New System of Agriculture*, "Preface to the Reader" (London, 1726); Stephen Switzer, *Ichnographia Rustica*; or, *the Nobleman, Gentleman, and Gardner's Recreation*, iv, xvi, 1-97, *passim* (London, 1718), and *The Practical Fruit-Gardener*, dedication (London, 1724); Richard Bradley, *The Country Gentleman and Farmer's Monthly Director*, v-vi, ix, xvi-xvii, 9-10 (London, 1727); William Ellis, *The Modern Husbandman*, "Preface for the Month of May," 2:v-vi (London, 1744); Robert Maxwell, *The Practical Husbandman*, dedication, 380, and *passim* (Edinburgh, 1757); Arthur Young, *The Farmer's Letters to the People of England*, 1:1-4 (ed. 3, London, 1771); Anonymous, *Agriculture Anatomiz'd*; or, *a New Treatise of Husbandry*, 100-101 (London, 1746); John Mills, *A New and Complete System of Practical Husbandry*, 1:iii-xvi (London, 1762); Alexander Hunter, *Georgical Essays*, 7 (New York, 1777). The list could be extended almost indefinitely, and could be run continuously to the present

THE AGRICULTURAL ENTHUSIASM

Although agriculture received a small amount of concern from the great during the sixteenth century, it fell from esteem in the seventeenth. In the age of Richelieu, Mazarin, and the Grand Monarch, the French nobleman, though he controlled the land and lived ultimately on income from it, was by no means disposed to give serious consideration to its cultivation. Love, war, politics, hunting, gambling, literature, and honor were alone worthy of his concern. In general, this was the fashionable attitude throughout most of western Europe during the seventeenth century.

Sometime around 1700 changes in this attitude began to appear. The vogue of formal gardening which seems to have spread from the court of Louis XIV found a considerable following in England and began imperceptibly to extend to orchardry and kitchen gardening and finally to general agriculture in the days of Anne and George I. In the 1720's, this fashionable craze reached an initial climax in England. As early as 1717, it was recorded that "Husbandry has been much in vogue in England in late Times." The Society of Improvers in the Knowledge of Agriculture in Scotland was founded in 1723, and soon "the Number of Members increased so much, that it amounted to upwards of 300 of the Flower of the Nation, whereof about fifty were Peers."²⁷ In 1726, John Lawrence dedicated his *New System of Agriculture* to the Princess of Wales, and in the dedication was able to mention the pleasure that his royal patroness was "sometimes pleased to take in viewing the effects of such Experiments as are the Subject of this Treatise." Before long, Jethro Tull was explaining his theories to an interested audience at court; Bolingbroke indulged a new taste for a sort of bucolic rococo by having his buildings at Dawley Farm painted with ricks and spades and other rustic devices; Robert Walpole was rumored to give first attention to letters from his farm steward even over important

day. For the purposes of this paper, it is sufficient to carry the thread of this thought in agricultural literature only to the mid-eighteenth century, at which time it emerged into currency in non-agricultural writing and thought.

²⁷ Maxwell, *Practical Husbandman*, 382.

state dispatches; and Alexander Pope enjoyed the rôle of rural philosopher among his cabbages and turnips.²⁸ Lord Townshend, in retirement at Raynham, where the Tullian system was used, came to be known, without malice, as "Turnip" Townshend, and Queen Caroline patronized the doggeral of Stephen Duck, "the thrasher poet," for no better reason than that he was genuinely a farm boy.²⁹

About the middle of the century, the English vogue of agriculture became a veritable craze, and the Continent also took it up with great enthusiasm. Agricultural societies were organized; journals devoted to agricultural subjects sprang up; and books on agriculture appeared in almost endless numbers. An authority on the Physiocratic movement has stated that the taste for agriculture and rural economics developed after 1748, was accentuated around 1756, and declined slowly after 1770.³⁰ Voltaire noted that about 1750 France turned its attention to agriculture as a relief from "de vers, de tragédies, de comédies, d'opéras, de romans, d'histoires romanesques, de réflexions morales plus romanesques encore, et de disputes théologiques sur la grâce et sur les convulsions."³¹ In 1764, Grimm explained somewhat cynically that "La folie de l'agriculture avant succédé à la folie de la géométrie qui, de son côté, avait succédé à la folie du bel esprit, les livres qui paraissent tous les jours sur cette matière sont innombrables."³² In 1768, the Dauphin, who is supposed to have boasted that he had memorized *L'Ami des hommes*, plowed a famous furrow with a beribboned plow at Versailles. A year later his brother-in-law, the Emperor Joseph, performed a similar ceremony in Moravia.³³ Frederick II's latter-day concern for agriculture is well-known. Marie

²⁸ Lord Ernle (R. E. Prothero), *English Farming, Past and Present*, 173-174 (London, 1917).

²⁹ M. R. Davis, *Stephen Duck, the Thresher-Poet*, 45-54, *passim* (Orono, 1926).

³⁰ Georges Weulersse, *Le Mouvement physiocratique en France (de 1756 à 1770)*, 2:151-152 (Paris, 1910).

³¹ *Ibid.*, 1:25.

³² Maurice Tourneux, ed., *Correspondance littéraire, philosophique et critique par Grimm, Diderot, Raynal, Meister . . .*, 5:508 (Paris, 1878).

³³ Henry Higgs, *The Physiocrats*, 89 (London, 1897).

Antoinette succumbed to the fad, and the *hameau* at Versailles was a doll-house memento of the royal honors that were being paid to turnips, plowboys, horse hoes, and manure piles. George III, who had a model farm at Windsor, gave evidence of satisfaction at being called "Farmer George," and contributed to Arthur Young's *Annals* under the pen name of Ralph Robinson.³⁴ Margrave Karl Friedrich of Baden, Gustavus III of Sweden, Catherine the Great, Leopold II as Grand Duke of Tuscany, Stanislaus of Poland, Charles III of Spain, and Ferdinand of Naples were among other rulers who manifested keen interest in agriculture.³⁵

The agricultural enthusiasm was without doubt one of the singular features of the eighteenth century. Farming came to engage the attention of kings, queens, princes, lords, statesmen, scientists, philosophers, poets, courtiers, and burghers who previously could not distinguish flax from turnips. The literature on agriculture increased greatly in volume, and above all it gained the patronage of the upper strata of society that decided matters of taste and fashion, thus disposing them to look with sympathy on farming and rural life. It supplied reiterated expression of the traditional agrarian philosophy that exalted the country, and it invited the inference that complicated and artificial society destroys the pristine virtues of men as they exist in a more natural *agricultural* state. This philosophy invited the condemnation of the entire fabric of urban culture, and suggested as an alternative a comparatively primitive agricultural and pastoral state.

APOLLO AND THE TURNIP PATCH

Contemporaneously with the development and spread of the agricultural enthusiasm there was a far-flung evolution in tastes and attitudes that is generally called the Romantic Movement. This movement has been intensively examined, analyzed, and debated, but no two authorities define it exactly alike nor agree on its scope. Almost all students do agree, however, that among

³⁴ Ernle, *English Farming, Past and Present*, 196, 207.

³⁵ Higgs, *Physiocrats*, 84-89.

the most characteristic and fundamental features of Romanticism was the so-called return to nature, including a belief in the goodness of nature and unspoiled man. There are infinite manifestations of this feature, varying from poems describing mountains, brooks, and birds' songs, to philosophical discourses expounding the thesis that civilization has corrupted man's pristine virtues. Political and economic theory was developed correspondingly upon the same set of premises and suppositions. Inasmuch as all of these expressions of the Romantic Movement have a close similarity to the traditional agrarian philosophy, and became prominent during the period of the agricultural enthusiasm, it is pertinent to examine their development with reference to agricultural literature.

Recent monographs in the field of literary history point out that English Romantic nature poetry of the eighteenth century evolved principally out of three conventional attitudes: the city (or court) was inherently turbulent, corrupt, and sinful; the country was inherently quiet, humble, peaceful, and virtuous; and all nature offered revelation of God.³⁶ Literary historians have thus disclosed that the themes and attitudes from which English Romantic nature poetry developed were identical with the most commonly expressed attitudes of the traditional and agrarian philosophy. Furthermore, it has been shown that there was a phenomenal increase in the amount of topographical poetry during the eighteenth century and that a very large part of it was descriptive of farms and country seats.³⁷

There is no intention to contend here that the Romantic Movement was caused solely by the agricultural revolution, nor that

³⁶ The third point was first developed by C. A. Moore in "The Return to Nature in English Poetry of the Eighteenth Century," *Studies in Philology*, 14:243-291 (July 1917). A. L. Reed, in *The Background of Gray's Elegy* (New York, 1924), shows that the development of the retreat theme—inferred from 1 and 2—contributed to the development of such poetry as Gray's "Elegy." G. G. Williams, in "The Beginnings of Nature Poetry in the Eighteenth Century," *Studies in Philology*, 27:583-608 (October 1930), concludes his investigations of the origins of English nature poetry by citing three main sources of which the three points listed are abbreviations.

³⁷ R. A. Aubin, *Topographical Poetry in XVIII-Century England* (New York, 1936).

agricultural literature was the only source of those Romantic concepts with which we are here concerned. No social phenomena have single causes, and the Romantic Movement was an extremely involved social phenomenon. There is room for philosophic doubt as to whether we should ever carry the logical concept of cause and result into the study of social evolution. It might be best to speak of "relationships" and of "accompanying factors." Nevertheless, there is demonstrably a significant duplication of agrarian philosophy in early Romantic literature that cannot be dismissed as mere coincidence.

In 1700, an otherwise unimportant clergyman wrote a poem called "The Choice," in which he expressed the idea that if he were granted his most cherished wish, he would choose quiet retirement in a modest country seat.³⁸ About the same time, the youthful Alexander Pope wrote his famous "Ode on Solitude" which expressed nostalgic yearning for a humble rural haven. In 1704, John Hughes praised the simple blessings of country life in his poem, "A Thought in a Garden."³⁹ One of the great monuments of the early Romantic tendency was the long didactic poem, *Cyder* (1708), by John Philips. It is noteworthy that this poem was an imitation of the *Georgics*, and was entirely a description of cider making. Its detail was also significant. In the generic and contrasting descriptions, the evil men were of the court and town, and "Th' Honest Man" was a countryman.⁴⁰ In Miltonic lines, Philips praised his master Virgil:

Thus sacred *Virgil* liv'd, from courtly Vice,
And Baits of pompous *Rome* secure; at Court
Still thoughtful of the rural honest Life,
And how t' improve his Grounds, and how himself.⁴¹

In addition to instruction in making cider, Philips urged improvement of soil, plants, and livestock by scientific experimentation, and advised his readers to drink good English cider instead of

³⁸ John Pomfret, *Poems upon Several Occasions*, 1-7 (London, 1731).

³⁹ Robert Anderson, ed., *Select British Poets, and Translations*, 7:304 (London, 1794).

⁴⁰ Mary G. Lloyd Thomas, ed., *The Poems of John Philips, Cyder*, book 1, lines 718-772 (Oxford, 1927).

⁴¹ *Ibid.*, lines 773-776.

imported wines.⁴² In so doing, he was using the standard arguments of current English books on agriculture.

John Gay associated peace and quiet with the country, and noise and hurry with the town in two major poems, "Wine" (1708), and "Rural Sports" (1713).⁴³ William Somerville moralized:

To the gay town where guilty pleasure reigns,
The wise good man prefers our humble plains.⁴⁴

and William Broome expressed his own preference as follows:

Free from the lust of wealth, and glittering snares,
That make th' unhappy great in love with cares,
Me humble joys in calm retirement please,
A silent happiness, and learned ease.⁴⁵

Ambrose Philips, whose pastoral poems were first printed in Tonson's *Miscellany* in 1709, expressed his philosophy most explicitly in prefatory remarks:

To view a fair stately palace, strikes us indeed with admiration, and swells the soul with notions of grandeur: but when I see a little country-dwelling, advantageously situated amidst a beautiful variety of hills, meadows, fields, woods, and rivulets, I feel an unspeakable sort of satisfaction, and cannot forbear wishing my kinder fortune would place me in such a sweet retirement.⁴⁶

James Wright's "Burley on the Hill" (1714) was a paean of praise to one who, in rural retirement, could:

On his own Grounds, in Nature's Freedom, find
All the soft Joys of Primitive Mankind.⁴⁷

In "Health: An Eclogue," Thomas Parnell made good health a blessing peculiar to the country, while "sloth," "disease," and "luxurious ease" were characteristic of "the sultry town."⁴⁸ In

⁴² *Ibid.*, lines 300-303, 326-374; book 2, lines 298-307.

⁴³ G. C. Faber, ed., *Poetical Works of John Gay*, "Wine," 4, "Rural Sports," 107 (London, 1926).

⁴⁴ Anderson, *Select British Poets*, "To Mr. Addison Occasioned by his Purchasing an Estate in Warwickshire," 8:493. See also Somerville's translation of Horace's tenth Epistle, *ibid.*, 511.

⁴⁵ *Ibid.*, "An Epistle, To my Friend Mr. Elijah Fenton," 757.

⁴⁶ *Ibid.*, "Preface to the Pastoral Poems," 9:383.

⁴⁷ Aubin, *Topographical Poetry*, 124.

⁴⁸ Alexander Chalmers, ed., *The Works of the English Poets*, 9:361 (London, 1810).

1724, the Reverend James Ward, referring to the city in "Phoenix Park," wrote as follows:

I learn her Vice and Follies to despise,
And love that Heav'n which in the Country lies.⁴⁹

Aaron Hill in 1726 joined other poets in expressing his profound yearning for a simple country life.⁵⁰ The main philosophic theme of John Dyer's ambulatory reflections in "The Country Walk" (1726) concerned the vanity of ambition, and turned to exaltation of the humble. Exemplifying this attitude was an apostrophe inspired by the sight of a farmer sleeping in the field:

Happy swain, sure happier far
Than lofty kings and princes are!
Enjoy sweet sleep, which shuns the crown,
With all its easy beds of down.⁵¹

Not long before his early death in 1727, William Pattison wrote "A Harvest Scene," which was a sympathetic, realistic portrayal of a dignified and aged farmer watching his sons take in the grain.⁵²

There are few if any books more widely credited with spreading the doctrine of a literary return to nature than James Thomson's *Seasons*. The first part of this landmark of Romantic tendency appeared in 1726, and major additions came during the next four years. In view of this nice coincidence with the first climax of the agricultural enthusiasm in England, the following lines are worth quoting:

Be gracious, Heaven! for now laborious Man
Has done his Due. Ye fostering Breezes blow!
Ye softening Dews, ye tender Showers descend!
And temper all, thou influential Sun,
Into the perfect Year! Nor, Ye who live
In Luxury and Ease, in Pomp and Pride,
Think these lost Themes unworthy of your Ear.
'Twas such as these the Rural Maro sung
To the full Roman Court, in all it's height
Of Elegance and Taste. The sacred Plow
Employ'd the Kings and Fathers of Mankind,

⁴⁹ Aubin, *Topographical Poetry*, 126.

⁵⁰ Chalmers, *Works of English Poets*, "The Choice," 13:252.

⁵¹ *Ibid.*, 250.

⁵² Anderson, *Select British Poets*, 8:579-580.

In ancient Times. And Some, with whom compar'd
 You're but the Beings of a Summer's Day,
 Have held the Scale of Justice, shook the Launce
 Of mighty War, then with descending Hand,
 Unus'd to little Delicacies, seiz'd
 The Plow, and greatly independant liv'd.
 Ye generous Britons, cultivate the Plow!⁵³

In "Summer," Thomson concluded the description of a sheep-shearing with the lines ascribing all of England's prosperity to her pastoral industry. The passage begins:

A Simple Scene! yet hence Britannia sees
 Her solid Grandeur rise.⁵⁴

Thomson pursued the Golden Age and rural retreat themes in detail. In "Spring," he described fondly the happy pastoral life of the Golden Age, contrasting it sharply with the grief and corruption of his own "Iron Times."⁵⁵ In "Autumn," he wrote:

The happiest he! who far from public rage,
 Deep in the vale, with a choice few retir'd,
 Drinks the pure pleasures of the rural Life.

* * *

The rage of nations, and the crush of states
 Move not the man, who, from the world escap'd,
 In still retreats, and flowery solitudes,
 To Nature's voice attends.⁵⁶

The theme of retreat from the harried city to the peaceful country was developed in Richard Savage's "A Poem on her Majesty's Birth-day, 1734-35," Lord Lyttelton's "Verses written at Mr. Pope's House at Twickenham," Samuel Boyse's "Nature" and "Retirement: A Poem, Occasioned by Seeing the Palace and Park of Yester," and William Shenstone's "Elegy I. To a Friend" and "Rural Elegance."⁵⁷ In "The Enthusiast," Joseph

⁵³ Otto Zippel, ed., *Thomson's Seasons*, "Spring," p. 10, lines 48-65 (Berlin, 1908).

⁵⁴ *Ibid.*, "Summer," p. 89, lines 423-424.

⁵⁵ *Ibid.*, "Spring," p. 17-21, lines 267-350.

⁵⁶ *Ibid.*, "Autumn," p. 229, 231, lines 1132-1134, 1199-1202.

⁵⁷ Williams, "Beginnings of Nature Poetry," *Studies in Philology*, 27:592; Anderson, *Select British Poets*, 10:260-261; Chalmers, *Works of English Poets*, 13:267, 282-284; 14:567, 576-579.

Warton celebrated the joys of men who lived before there were any cities,

who in sheltering groves
Warm caves, and deep-sunk vallies liv'd and lov'd,
By cares unwounded.⁵⁸

He reiterated this theme in "To a Lady Who Hates the Country" and "Ode on Solitude."⁵⁹ An anonymous poem called "The Wish" that appeared in 1747, an obvious imitation of Pomfret's "Choice" and of Pope's "Ode on Solitude," has been brought to light by the Dutch student of English Romanticism, C. E. de Haas.⁶⁰ In the long poem "Cambria" (1749), Richard Rolt revealed his awareness of agricultural wealth, and celebrated the fleece as Thomson had done, and Dyer and Dodsley were to do later,⁶¹ and developed the retreat theme in terms equally hackneyed among poets and writers on agriculture:

Happy the man, approv'd, and blest by heav'n,
That in the sylvan shade shakes from his breast
The bait of folly, and the sting of vice.⁶²

By 1751, Dr. Samuel Johnson could safely declare that "There is, indeed, scarcely any writer who has not celebrated the happiness of rural privacy."⁶³ With equal truth he could have added that they wrote in terms and arguments identical with those immemorably employed in agricultural writings.

Christopher Smart's poem, "The Hop Garden" (1752), Robert Dodsley's "Agriculture" (1753), George Jeffrey's translations of Books 1 and 12 of Vanière's *Praedium Rusticum* (1754), John Dyer's "The Fleece" (1757), James Grainger's "The Sugar Cane" (1764), and William Cowper's "The Garden," in Book 3 of *The Task* (1785), variously reflected the most direct impact of the agricul-

⁵⁸ Chalmers, *Works of English Poets*, 18:160.

⁵⁹ *Ibid.*, 168-169.

⁶⁰ *Nature and the Country in English Poetry of the First Half of the Eighteenth Century*, 60-61, (Amsterdam, 1928).

⁶¹ *Select Pieces, By the Late R. Rolt, "Cambria,"* book 2, lines 23-29 (London, 1772).

⁶² *Ibid.*, lines 177 ff.

⁶³ Samuel Johnson, *The Rambler*, no. 135, 3:158 (London, 1783).

tural vogue upon literary fashions; but the more pervasive, more important, and more subtle influence had already helped to establish a new general tendency in English letters, which by mid-century was productive of such a masterpiece as the humble "Elegy in a Country Church Yard." Tastes were so changed that there was sympathy for "The Deserted Village" (1770), acceptance of Robert Burns, and eventually a welcome for William Wordsworth.

On the Continent, the development of Romantic nature poetry was similarly characterized by a philosophy identical with that of agricultural literature. Albrecht von Haller's "Die Alpen" (1732), which was to early German Romanticism what Thomson's *Seasons* was to English Romanticism, concluded with a long passage deploring the hypocrisy, corruption, and decadence of cities, and praising the virtues and simple felicity inherent in rural life. There was first a passage depicting the grievous, sinful lot of those condemned to live in cities followed by a contrasting description of the simple, happy, virtuous farmer.

Elende! rühmet nur den Rauch in grossen Städten,
Wo Bosheit und Verrath im Schmuck der Tugend gehn,
Die Pracht, die euch umringt, schliesst euch in güldne Ketten,
Erdrückt den, der sie trägt, und ist nur andern schön.

* * *

O selig! wer wie ihr mit selbst gezognen Stieren
Den angestorbnen Grund von eignen Aeckern pflügt;
Den reine Wolle deckt, belaubte Kränze zieren
Und ungewürzte Speis aus süsser Milch vergnügt;
Der sich bei Zephyrs Hauch und kühlen Wasser-Fällen,
In ungesorgtem Schlaf auf weichen Rasen streckt;
Den nie in hoher See das brausen wilder Wellen,
Noch der Trompeten Schall in Bangen Zelten weckt;
Der seinen Zustand liebt und niemalswünscht zu bessern!
Das Glück ist viel zu arm, sein Wohlsein zu vergrössern.⁶⁴

"Das Landleben" (1745) of Ewald von Kleist expressed almost identical sentiments.⁶⁵

Solomon Gessner's influential prose poems, the *Idyllen*, began

⁶⁴ Ludwig Hirzel, ed., *Albrecht von Hallers Gedichte*, 40-42 (Frauenfeld, 1882).

⁶⁵ August Sauer, ed., *Des Herrn Christian Ewald von Kleist sämtliche Werke*, 25-28 (Berlin, 1766).

to appear in the sixties. Their philosophy echoed the traditional apology of agriculture most often by implication, but occasionally that attitude became explicit, as in the following excerpt:

O könnt' ich unbekannt und still, fern vom Getümmel der Stadt, wo dem Redlichen unausweichliche Fallstricke gewebt sind, wo Sitten und Verhältnisse tausend Thorheiten adeln, könnt' ich einsamer Gegend mein Leben ruhig wandeln, im kleinen Landhaus, beym ländlichen Garten, unbeneidet, unbemerkt!⁶⁶

Gessner specified that he did not wish a country retreat for purposes of ostentation or sensual delight; what he really wanted was a "kleines Landhaus," and his companion on equal terms would be "der fromme Landmann." This constituted almost complete acceptance of the social implications of the ancient agrarian philosophy.

In France, the literary currents of Romanticism developed very slowly, possibly because classic taste and forms were so firmly established there; but the growth of Romantic nature poetry followed the same general trend that it had taken in England and Germany, with close adherence to the traditional philosophy of agriculture. The earliest French poem expressing this philosophy was printed, fittingly enough, in the 1711 Paris edition of Vallemont's *Curiositez de la nature*.

Je ne vois pas ici les vices:
Leur empire est ambitieux;
Ils dédaignent ces petits lieux,
Où n'habitent pas les délices.
Cette exécrable faim de l'or,
N'a pas fait arriver encor
L'art de tromper, & de surprendre;
Sur ces monts, & sous ces ormeaux:
Les embuches, qu'on y vient tendre,
Ne sont que contre les oiseaux.⁶⁷

First in 1729, then in 1749 and 1752, and many times thereafter, French translations of Haller's "Die Alpen" were published.⁶⁸ The first French version of Thomson's *Seasons* which appeared in 1759 was very significantly dedicated to Quesnay's

⁶⁶ Salomon Gessner, *Schriften*, 2:184, 187 (n.p., 1788).

⁶⁷ Vallemont, *Curiositez de la nature*, 30.

⁶⁸ M. B. Finch and E. A. Peers, *The Origins of French Romanticism*, 46 (London, 1920).

first Physiocratic lieutenant, the elder Mirabeau, who "had treated, as Statesman, the same subjects Thomson had treated, as poet."⁶⁹ Two years later Voltaire, by no definition a Romantic nature poet, inclined sufficiently to the tendency of the times to indite an "Épître sur l'agriculture" wherein he repeated all the customary features of the old praise of husbandry. The sweet pleasures of a rural retreat from urban cares were described; the reader was exhorted to improve and extend French cultivation; Turbilli's experiments were applauded; agriculture was praised as the fundamental of all economy, the sustainer of the nation and of the throne, and the first and heavenly-ordained labor of man.⁷⁰

In 1762, Sédaine's comedy in verse, *Le Roi et le fermier*, whose moral was that real honor and virtue are most likely to reside in the heart of the humble countryman, played to enthusiastic audiences. The same year, Mirabeau sought a new and better translation of Thomson's *Seasons*, feeling that such poetic descriptions of nature and the country aided the Physiocratic cause.⁷¹ The next year, Cardinal de Bernis published a translation that he had begun as early as 1748.⁷² In 1768, Favart's *Les moissonneurs* scored another popular success for dramatic representations of rural virtue.⁷³ Its basic philosophy is revealed by an *arriette* in the fourth scene of act 1:

Heureux qui sans soins, sans affaires,
Peut cultiver ses champs en paix!
Le plus simple toit de ses pères
Vaut mieux que l'éclat des palais.

⁶⁹ The translation, made by Mme. Bontems, appeared anonymously. M. M. Cameron, *L'Influence des saisons de Thomson sur la poésie descriptive en France (1759-1810)*, 16 (Paris, 1927).

⁷⁰ Louis Moland, ed., *Oeuvres complètes de Voltaire*, 10:378-382 (Paris, 1877-85).

⁷¹ Weulersse, *Mouvement physiocratique en France*, 2:153 and note 2.

⁷² Cameron, *L'Influence des saisons de Thomson*, 22.

⁷³ Grimm grudgingly recorded the success of *Les moissonneurs*, commenting that the reason for its success was that "le parterre et le gros du public aiment les sentences à la folie."—*Correspondance littéraire*, 8:31-32. Mirabeau welcomed its popularity, and again expressed his belief that his Physiocratic cause was well served by favorable, sentimental portrayals of country virtues.—Mirabeau to Rousseau, Feb. 3, 1768, in M.G. Streckeisen-Moultou, *J.-J. Rousseau, ses amis et ses ennemis*, 2:390-391, 393 (Paris, 1865).

Another revealing bit is the dialogue in act 1, scene 5, between the dissipated young Dolival, urban product, and his virtuous uncle who lived humbly on the land:

Dolival

Comme vous voilà fait, mon oncle! La décence

Veut un habillement conforme à la naissance:

Ou vous prendrait pour un fermier.

Candor

J'ai l'honneur d'en être un: je fais valoir ma ferme,

Et je me livre tout entier

Aux détails infinis que cet emploi renferme:

Je tire vanité de l'habit du métier.

In 1769, St. Lambert's famous and influential imitation of the *Seasons* first appeared. In the preface, he declared his purpose was in part to inspire respect and love for the country. *Les saisons* is a mine of reiterated expressions of traditional agrarian attitudes. On almost every page there is reference to the admirable country people, and to the decadence of court and city. Tyrannical absentee landlords were roundly condemned for their cruelty to the real tillers of the soil. Cities were depicted as living parasitically from the bounties of agriculture, yet inclined to reward farmers only with contempt. There was a stirring plea for agricultural betterment, both technical and political, and lavish praise for Lord Townshend and other English improvers.⁷⁴ An interesting sidelight is a tale, called "Sara Th. . .," that St. Lambert included in some later editions of *Les saisons*. It is a simple story, but nevertheless a Romantic tale *par excellence* of a noble Englishwoman who renounced rank and privilege to live in supreme felicity as a farmer's wife with the man she loved. The story indicated that it was the simple country life even more than love that insured her happiness.⁷⁵ The climax of immediate agricultural influence upon French *belles lettres* was perhaps attained by P.-F. Rosset's epic poem, *L'Agriculture* (1774) and

⁷⁴ J. F. Marquis de St.-Lambert, *Les saisons*, xxix, "L'Été," lines 129-163, 482-554; "L'Automne," 43, 228, 266, 471-546; "L'Hiver," *passim*; the tale, lines 608-861 (Amsterdam, 1775).

⁷⁵ *Ibid.*, p. 263-304.

Delille's *Homme des champs* (1775). *L'Agriculture* was reported to have been in the process of composition for thirty years.⁷⁶ Well before the publication of either of these works, however, the fundamental concepts of the agrarian philosophy had, by subtler means and processes, gained a wide currency among the fashionable and the intellectual.

BUCOLIC PHILOSOPHY

Casual observations concerning late eighteenth-century social philosophy supply additional sidelights. Jean-Jacques Rousseau's writings most effectively disseminated the back-to-nature philosophy of Romanticism. Treatises of great erudition have been written concerning Rousseau, and much effort and learning has been spent in an endeavor to ascertain exactly what he meant by the "state of nature."⁷⁷ It seems pertinent to remark that if his objective was so recondite that scholars cannot agree upon its nature after years of study, his popular influence could hardly have been great. Most likely he was more interested in broad generalities than in subtle nuances discovered by doctoral dissection. One of the latest studies of Rousseauistic philosophy concludes that what he really meant by his state of nature was not pure primitivism, but a patriarchal, pastoral-agricultural state.⁷⁸ His works abound with sentiments like the following:

Les hommes ne sont point faits pour être entassés en fourmilières, mais épars sur la terre qu'ils doivent cultiver. Plus ils se rassemblent, plus ils se corrompent. Les infirmités du corps, ainsi que les vices de l'âme, sont l'ineffaçable effet de ce concours trop nombreux. . . .

Les villes sont le gouffre de l'espèce humaine.⁷⁹

⁷⁶ *Correspondance littéraire*, 10:463.

⁷⁷ Louis Gottschalk, "Studies since 1920 of French Thought in the Period of the Enlightenment," *Journal of Modern History*, 4:252-256 and note 22 on p. 252 (June 1932).

⁷⁸ A. O. Lovejoy, "The Supposed Primitivism of Rousseau's *Discourse on Inequality*," *Modern Philology*, 21:165-186 (November 1923).

⁷⁹ See the following in *Oeuvres complètes de J. J. Rousseau* (Paris, 1864): *Emile*, 2:416; the *Discours* on the sciences and the arts, 1:472; the sympathetic description of simple peasant life with a condemnation of city lures and a statement of his purpose to inspire new love and respect for a simple farm life, in *La Nouvelle Héloïse*, 10-11, 305-306 ff.

Essentially, Rousseau's philosophy amounted in a large measure to a systematic development of the same concepts and attitudes that agricultural writers had always expressed.

The Physiocratic doctrine, even in its most elaborate form, was grounded fundamentally upon conceptions that agricultural literature had always advocated. Weulersse has noted the dependence of Physiocratic thought upon what he called a base of common ideas. According to his definition, these were: moral and political superiority of agriculture; agricultural resources the surest; priority of agriculture; agriculture alone gives a *revenu net*; economic primacy of property in land; free gift of nature; and disputed productiveness of mines and fisheries.⁸⁰ Agricultural writers traditionally expressed the first, second, third, and sixth of these basic principles, and occasionally hinted at the fifth. It should be mentioned, though no great importance is to be attached to it, that Quesnay's first and most beloved reading matter was supposed to have been the *Maison rustique*.⁸¹

Adam Smith, an economist highly esteemed today, repeated in his writings the old postulates of agricultural writings. In the *Wealth of Nations*, he praised the security and tranquillity of the farmer's life, and called it the natural and most favored occupation of man. He declared farmers were the most independent of all classes of men, generous and altruistic, the bulwark of the state, —healthful, skillful, and vigorous,—and the best soldiers. Although he carefully avoided the extremes of Physiocratic doctrine concerning the sole productivity of agriculture, he declared it the most productive of economic enterprises, and fundamental to them all.⁸²

Entering another field of thought, it seems pertinent to give the following quotation from the *Notes on Virginia* as a typical expression of the consistent attitude of Thomas Jefferson:

Those who labor in the earth are the chosen people of God, if ever He had a chosen people, whose breasts He has made His peculiar deposit for substantial

⁸⁰ Weulersse, *Mouvement physiocratique en France*, 1:244-280.

⁸¹ *Ibid.*, 1:44. See also the Comte d'Albon, "Éloge historique de M. Quesnay," in Auguste Oncken, ed., *Oeuvres économiques et philosophiques de François Quesnay*, 41 (Frankfurt and Paris, 1888).

⁸² *An Inquiry into the Nature and Causes of the Wealth of Nations*, ed. by Edwin Cannan, 1:355-359, 361, 389-390; 2:188-189, 267-268, 426-427 (London, 1920).

and genuine virtue. It is the focus in which He keeps alive that sacred fire, which otherwise might escape from the face of the earth. Corruption of morals in the mass of cultivators is a phenomenon of which no age nor nation has furnished an example. It is the mark set on those, who, not looking up to heaven, to their own soil and industry, as does the husbandman, for their subsistence, depend for it on casualties and caprice of customers. Dependence begets subservience and venality, suffocates the germ of virtue, and prepares fit tools for the designs of ambition . . . generally speaking, the proportion which the aggregate of the other classes of citizens bears in any State to that of its husbandmen, is the proportion of its unsound to its healthy parts, and is a good enough barometer whereby to measure its degree of corruption.⁸³

After investigating Jefferson's alleged dependence upon the Physiocrats for many of his ideas, Gilbert Chinard concluded that Jefferson was not indebted to any individual or group, although many of his tenets were remarkably similar to those previously and contemporaneously advocated by the French Physiocrats and *philosophes*. Chinard's case is admirably stated in one sentence: "We shall have to admit that there are times when ideas are in the air, when they seem common property, and when the attribution to any one of the paternity of any particular idea is well-nigh impossible. The eighteenth century was undoubtedly such a period."⁸⁴

This bit of wisdom seems applicable in the case of the present study. During the period of great agricultural enthusiasm, the attitudes regularly expressed in agricultural literature became common property, and were given new expression and elaboration by poets, dramatists, novelists, and builders of systems of philosophy, economics, and political theory. It is very questionable whether any poet, playwright, politician, or economist, ever read a treatise on agriculture and proceeded straightway to transfer the ideas he found there into his own medium of expression and system of thought. It is common knowledge that there were classic sources for the same or similar points of view. These other sources undoubtedly exerted an influence just as agricultural literature did, but immediate borrowings from literary sources

⁸³ *The Writings of Thomas Jefferson*, 2:229 (Memorial ed., Washington, D. C., 1904).

⁸⁴ "Jefferson and the Physiocrats," *University of California Chronicle*, 33:19 (January 1931).

cannot alone account for a vast evolution of attitudes and tastes. It is the assumption here that such an evolution must conform to more fundamental changes in the social organism, and that attitudes and tastes are inclined more to reflect than to cause these changes.

The seventeenth century found inspiration in the classics for formalism, elegance, and artificiality; the eighteenth century ultimately derived from them a wholly different influence. It was not the classics but the times that had changed. One century cultivated the pastoral, the next century abandoned it and adopted the significantly different georgic *genre*. One century read the *Aeneid*; the other read *Columella*. One century read *Theocritus*, converted pastoral into the *Astrée* and bucolic *préciosité*, but regarded the real, existing country as a desolation inhabited by bumpkins and boors such as *Monsieur de Pourceaugnac*, *Sir Oliver Cockwood*, and *Sir Polidorus Hogstye of Beast-Hall in Swine County*;⁸⁵ the next could not abide the glaring make-believe of neo-Arcadian romances among regal shepherds and blue-blooded shepherdesses, but found that turnips and horse hoeing merited royal consideration; that agriculture was a fit subject for poems of epic, Virgilian proportions; that humble rural people deserved the sober dignity of Gray's "Elegy;" and finally agreed with Oliver Goldsmith in "The Deserted Village," that

Princes and lords may flourish, or may fade;
A breath can make them, as a breath has made;
But a bold peasantry, their country's pride,
When once destroyed, can never be supplied.

The basis of this great evolution lay in the complex of changes throughout the entire social fabric, among the most important of which were those ordinarily called the commercialization of agriculture and the agricultural revolution. The story of both has been related by many writers, and the main facts are well-

⁸⁵ Molière, *Monsieur de Pourceaugnac* (Paris, 1669); Sir George Etherege, *She Wou'd if She Cou'd* (London, 1735); a character in "Aesop," in Bonamy Debré and Geoffrey Webb, eds., *The Complete Works of Sir John Vanbrugh*, act 4, scene 2, lines 1-81 (Bloomsbury, 1927).

known; but in view of the interpretation expounded here a brief recapitulation is desirable.

LANCELOT AND THE MARKET PLACE

Medieval agriculture was largely self-sufficient, and production for market was the exception rather than the rule. At the same time, proprietorship of land ordinarily involved status, duties, and prerogatives that were military, judicial, and gubernatorial. The medieval chatelain distinctly did not regard himself as a cultivator. He was a judge, a soldier, a local administrator. He may have found delight in his country residence—in hunting, in the yellowing wheat, in the song of birds—he may have squeezed out the last farthing that his tenants' fields could produce for him, but cultivation was not his business.

However, the development of centralized government gradually stripped proprietorship of its customary feudal functions, and more and more, land fell into the hands of wealthy bourgeoisie. Towns grew and multiplied, enlarging the market demand for food and raw material from farms. As early as the sixteenth century there was a perceptible and increasing number of proprietors in both France and England who exploited their land with a thoroughly *entrepreneurial*, commercial spirit.⁸⁶ On the whole, this accelerating tendency continued to prevail over most of western Europe throughout the seventeenth century. Many historians have been impressed by the apparent fact that the chief agents of the change to a more commercial agrarian outlook were the burghers who entered the landowning class during this period.⁸⁷ While individual instances of nobles who exploited their land in the new commercial fashion might be cited, the old nobility did not as a whole conform to the altering

⁸⁶ M. L. B. Bloch, *Les caractères originaux de l'histoire rurale française*, 148 (Oslo, 1931); R. H. Tawney, *The Agrarian Problem in the Sixteenth Century*, 191–193, *passim* (London, 1912); G. Renard and G. Weulersse, *Life and Work in Modern Europe*, tr. by Margaret Richards, 99–100 (New York, 1926).

⁸⁷ Ernle, *English Farming, Past and Present*, 85–86, 144; Tawney, *Agrarian Problem in the Sixteenth Century*, 177–310, *passim*; Bloch, *Les caractères originaux de l'histoire rurale française*, 148; Ernest Lavisse, *Histoire de France depuis les origines jusqu'à la révolution*, 8(1):221–222 (Paris, 1908).

conditions. Many of them lost their lands or let them to large-scale tenants who sometimes prospered and became owners.

Although the old feudal nobility lost much of its power, it retained the feudal ethos and continued to dominate the arbitration of social attitudes and tastes. The French nobility, imprisoned in pampered impotence at Versailles, took bread and butter, lace and brocade, as the automatic accompaniment of existence. Whenever the supply of these was threatened, the remedy lay in sharper exaction of the remaining feudal economic prerogatives, or, this failing, in royal bounty attained by grace or by conniving. The economic world was still of the lower order of things. A gentleman found that only politics, war, religion, love, honor, and duty deserved his participation or consideration. Artistic and literary standards reflected this attitude perfectly.

These conditions were more prevalent in France than elsewhere, but Versailles set the fashions in the western world, and the differences were principally in degree. Charles II established French tastes and customs at the English court, and the princes of the myriad German states sought feverishly to model their petty courts after that of the Grand Monarch. Thus, the dominance of the old feudal ideology over social standards and tastes was artificially prolonged into an age when its anachronism became increasingly apparent.

Meanwhile, agriculture was being slowly drawn into the orbit of developing capitalism. It faced a world in which the market was increasingly dominant, and readjustment was inevitable. Temporizing feudal arrangements might defer the day, but the competitive system would not forever postpone the elimination of the Don Quixotes who could not realize that times had changed. More and more it became possible to retain proprietorship of the land only by candid recognition of the new commercial nature of society and complete adaptation of farming practices to meet new conditions. In some cases, the older landowners changed their attitudes and ways, and prospered. In other cases, they lost their lands to burghers or to successful tenants.

English agriculture was the first to be widely penetrated by the

capitalistic spirit. N. S. B. Gras has shown that the city of London was the first to develop a metropolitan marketing system for agricultural products, and this necessarily implies a comparatively large amount of commercial farming.⁸⁸ The English gentry, politically dominant after the Restoration, manifested keen appreciation of the commercial nature of agriculture by their enactment of the protective tariff measures of 1663 and 1670, and the corn-bounty laws of 1673 and 1689.⁸⁹ These measures were of great significance in that they constituted a complete reversal of the traditional English grain policy in particular, and of the medieval policy of provision in general. This policy of provision was perpetuated longest in regard to foodstuffs, continuing in application there long after Mercantilist protective policies had become the fashion for most industrial products.⁹⁰

In the eighteenth century, landed proprietors in European states began to demand and attain state favors for the national agriculture commensurate with those that commerce and industry had already long enjoyed. For instance, although Denmark had varied the traditional export restrictions on agricultural products with a few on imports in the seventeenth century, a law enacted in 1735 and effective for the next half century forbade grain import except from the duchies, and permitted free export—the net result of which was to exploit the people of dependent Norway for the profit of Denmark's landed gentry.⁹¹ In Prussia, the medieval policy of provision in respect to grains was terminated violently by Frederick William I, and protectionist policies substituted. Frederick II continued and developed his father's policy of manipulating import and export regulations in the interest of high grain prices.⁹² In France, agriculture was slower

⁸⁸ *History of Agriculture in Europe and America*, 130, and *The Evolution of the English Corn Market from the Twelfth to the Eighteenth Century* (Cambridge, 1915).

⁸⁹ The best study of this subject is D. G. Barnes, *A History of the English Corn Laws, from 1660 to 1846* (London, 1930).

⁹⁰ E. F. Heckscher, *Mercantilism*, tr. by Mendel Shapiro, 2:91 ff. (London, 1935).

⁹¹ *Ibid.*, 2:93; W. Naudé, *Die Getreidehandelspolitik der Europäischen Staaten vom 13. bis zum 18. Jahrhundert*, 392-394 (Berlin, 1896).

⁹² Heckscher, *Mercantilism*, 2:93; W. Naudé, *Die Getreidehandelspolitik und Kriegsmagazinverwaltung Brandenburg-Preussens bis 1740*, 206-253 (Berlin, 1901),

in recognizing its commercial interests and in making effective demands for state recognition. The dissociation of the landed nobility from the economic interests of the land was attended during the seventeenth century by national fiscal and economic policies that were a very severe handicap to French agricultural development.⁹³ Almost the only strong protests against the injustices worked upon the agricultural population were the futile peasant insurrections of 1662, 1664, 1670, and 1675.⁹⁴ Other than relief from the exacerbating taxation under which it labored, however, what French agriculture most needed was freedom from local and provincial restrictions upon the grain trade; and while Colbert had it upon his agenda to repair this evil, he actually accomplished very little.⁹⁵ About 1700, agricultural interests began to apply political pressure in national circles in an effort to liberate agricultural produce from the medieval restrictions that hampered its sale. There was relaxation of export restrictions on wool in 1716 and on hemp in 1719.⁹⁶ Through the first half of the eighteenth century, greater freedom for the grain trade was more generally advocated by doctrinaire liberals and the increasingly articulate agricultural interests. If France had to await the Physiocrats for a coherent and forceful expression of the capitalistic demands of the new, commercialized agriculture, the growth in the meantime of a capitalistic spirit of agricultural enterprise was illustrated by the ill-fated attempt, in 1740, of a Paris company to conduct large-scale cultivation of rice at

and (with A. Skalweit), *Die Getreidehandelspolitik und Kriegsmagazinverwaltung Preussens 1740-1756*, p. 61, 241 (Berlin, 1910); August Skalweit, *Die Getreidehandelspolitik und Kriegsmagazinverwaltung Preussens 1756-1806*, p. 5, 149-179, 647-672 (Berlin, 1931).

⁹³ Naudé, *Die Getreidehandelspolitik der Europäischen Staaten*, 33-34.

⁹⁴ Henri Sée, *La France économique et sociale au XVIII^e siècle*, 42-44 (Paris, 1925).

⁹⁵ Renard and Weulersse, *Life and Work in Modern Europe*, 205-206; A. P. Usher, *The History of the Grain Trade in France, 1400-1710*, p. 268-294 (Cambridge, Mass., 1913); Weulersse, *Mouvement physiocratique en France*, 1:3; Heckscher, *Mercantilism*, 1:211-212; Lavissee, *Histoire de France*, 8(1):217.

⁹⁶ Lavissee, *Histoire de France*, 8(1):214-219; Renard and Weulersse, *Life and Work in Modern Europe*, 205.

Thiers.⁹⁷ After about 1725, both land and agricultural products gradually rose in price.⁹⁸

One evidence of the developing commercial spirit is to be found in certain characteristics of evolving agricultural literature. The agricultural writings of the sixteenth century had been for the most part compendious manuals of country life. They included information on all manner of things: medicinal herbs, home remedies, the choice of servants, hunting, fishing, brewing and wine making, flower gardens, cookery—everything, in fact, connected with resident rural proprietorship. Ordinarily there was no major appeal to the profit motive, merely instructions on how things should be done best in the country. However, in England, around the time of the Civil War, many agricultural writers began to urge improvements in method on the ground that this was the way to wealth. Sometimes fabulous fortunes were promised to those who would follow directions and breed rabbits and plant turnips and clover.⁹⁹ Gradually this early commercial enthusiasm on the part of a few agricultural writers matured into the practice, universally approved in Arthur Young's day, of employing money values as the final criteria of all practical agricultural experimentation.

THE TRIUMPH OF THE TURNIP

Just as evolving capitalism created pressures which resulted in that technical improvement of agriculture generally called the agricultural revolution,¹⁰⁰ so also it forced the proprietors of the land to regard themselves primarily as agriculturists. The landed proprietor had ceased to be a feudal lord, and became a rural *entrepreneur*. The old feudal ideology did not conform to the new status; circumstances compelled the adoption of a new

⁹⁷ Weulersse, *Mouvement physiocratique en France*, 1:333, 379; 2:707-710; P.-M. Bondonio, "Un essai de culture exotique sous l'Ancien Régime; Le 'Peste du Riz' de Thiers (1741)," *Revue d'histoire économique et sociale*, 16:586-655 (1928).

⁹⁸ Lavissee, *Histoire de France*, 8(2):358 (Paris, 1909). Land values and rents rose proportionately more than did the products of the land, indicating that the proprietors benefited more than *fermiers*.

⁹⁹ Speed, *Adam out of Eden*; Lord Ernle, "Wisdom and Folly of Ancient Book-Farmers," *Journal of the Ministry of Agriculture*, 29:208 (June 1922); Arthur Young, *A Course of Experimental Agriculture*, 1:ix (Dublin, 1771).

¹⁰⁰ Gras, *History of Agriculture in Europe and America*, 220.

code of ethics, conduct, and taste. The point of view expressed in the traditional agrarian philosophy offered the materials for a *Weltanschauung* suitable to the new economic status of the proprietor. It flattered the virtues and importance of the class to which it applied and provided satisfactory premises upon which to argue the advancement of rural economic and political interests. In an age that placed an unusually high valuation upon classic dicta, it carried all the hoary prestige that time could give.

It was only natural that the art, literature, and philosophy that would appeal to the new class of proprietors should be based upon the fundamental premises of the readjusted social outlook. It does not follow that all poetry, for instance, should forever confine itself within the narrow limits of Virgil's *O fortunatos nimium* theme. Such a procedure would have ended in no poetry at all. However, a point of departure was provided for a whole new world of literary and philosophic expression.

Certain phases and implications of the old agrarian conception were not wholly acceptable to the new proprietor class. Rousseau, building logically upon the same assumptions, condemned the institution of property, and developed a semi-primitive philosophy with which the aristocratic Physiocrats disagreed violently. Those who, like Jefferson, developed its democratic implications were not always welcomed by the aristocracy. In much the same way that directors of monopolistic corporations today praise the virtues of a competitive economy, the great landowners of the eighteenth century praised the virtues of the humble tiller of the soil. They seem to have believed sincerely that the praise of Cincinnatus applied to them.

The old agrarian philosophy was peculiarly adapted to the agricultural needs of the day. Political policies deemed favorable to agriculture were ordinarily opposed by industrial and commercial groups. The result was a clash between urban and rural interests: in England over the Corn Laws, in France over the entire Physiocratic program, and in Prussia over Frederick's policies of keeping grain prices high.¹⁰¹ In this contest between

¹⁰¹ Barnes, *History of the English Corn Laws*, 23 ff.; Weulersse, *Mouvement physiocratique en France*, 2:387-433; Skalweit, *Die Getreidehandelspolitik und Kriegsmagazinverwaltung Preussens*, 149, 165.

city and country, the philosophy exalting the country and vilifying everything connected with the city offered excellent consolation and propaganda.

Many advocates of agricultural improvement manifested a special interest in poetry and in other art forms that directed sympathetic attention to the country and to rural life. Arthur Young sponsored the English publication of a German treatise called *The Rural Socrates*, which amounted essentially to an identification of the traditional virtues of Golden Age man in the character of a living Swiss peasant, and which, though it gave minor attention to matters of cultivation, was primarily philosophic in character.¹⁰² The French edition of this book was significantly dedicated to the Physiocrat Mirabeau who expressed great satisfaction with the philosophy it preached.¹⁰³ Later editions, which had a wide, international circulation among agricultural improvers, carried long addenda compiling many similar discoveries of Golden Age virtue in the breasts of living peasants. Many instances could be cited where specific encouragement was given artistic treatment of rural subjects by the spokesmen of agrarian interest. The *Journal économique* and the *Ephémérides du citoyen* lost their customary aloofness to artistic matters and indulged in unrestrained praise and enthusiasm when books, poems, or plays that directed sympathetic attention to rural subjects appeared.¹⁰⁴ The older Mirabeau, who appreciated

¹⁰² The first English edition of *The Rural Socrates* was bound with Arthur Young's *Rural Oeconomy* (London, 1770), and carried a laudatory preface by Young. The original, by H. C. Hirzel, *Die Wirthschaft eines Philosophischen Bauers*, first appeared in the *Abhandlungen der Naturforschenden Gesellschaft in Zürich*, 371-496 (Zurich, 1761).

¹⁰³ In a letter approved and corrected by Quesnay, Mirabeau wrote to Frey des Landres, the French translator, on Nov. 8, 1762: "Il renferme les méthodes et l'exemple de la plus saine et éclairée agriculture, de la plus noble philosophie et de la plus digne piété. Kliougg [*the Swiss peasant whose philosophy the book described*] est mon héros à tous égards."—*Le Socrate rustique*, 1:305-306 (Lausanne, 1777). See also the reproduction of this letter, and notes upon it in Georges Weulersse, ed., *Les manuscrits économiques de François Quesnay et du Marquis de Mirabeau*, 83-86 (Paris, 1910).

¹⁰⁴ Weulersse, *Mouvement physiocratique en France*, 2:153-154 and note 1 on p. 154; Cameron, *L'Influence des saisons de Thomson*, 45; *Ephémérides du citoyen*, February 1769, p. 45; November 1769, p. 6-10; *Journal économique*, January 1756, p. 21-23.

the value of propaganda, argued elaborately that the advancement of agricultural interests demanded a policy of honoring the humble tiller of the soil, and on numerous occasions he gave concrete encouragement to poetic and artistic expressions that tended to dignify rural life.¹⁰⁵ Agricultural and economic societies established prize competitions for literary exercises on rural and economic themes.¹⁰⁶ Agricultural writers frequently cited and praised the works of others who expressed views and philosophies sympathetic to rural interests. Albrecht von Haller was a notable botanist, and was among the founders of the economic society of Bern as well as of the scientific society of Göttingen, of which he was perpetual president. It would be an error to place much emphasis upon the specific influence of such incidents, yet they serve to indicate that there were contemporaries who fully appreciated that certain very important phases of Romantic thought conformed with the new agrarian and agricultural interests.

The commercialization of agriculture supplied pressure for technical improvements and at the same time forced the owners of the land into an awareness of their primary status as agriculturists. These developments were accompanied by an agricultural enthusiasm which disseminated the old agrarian philosophy. The economic and social changes in agriculture guaranteed a welcome for this philosophy, which otherwise could not have been accepted. Economic changes thus helped to give currency to new ideas and offered materials for new attitudes; and most important, they provided a public eager to receive a new ideology. In this way, the agricultural revolution had a significant influence upon the development of new literary movements, new philosophies, and new standards of taste and judgment.

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¹⁰⁵ *L'Ami des hommes*, 1:124-153; Weulersse, *Mouvement physiocratique en France*, 2:153 and note 2 on p. 154.

¹⁰⁶ *Journal économique*, January 1756, p. 21-23.

THE TECHNICAL ANCESTRY OF GRAIN-MILLING DEVICES¹

Milling, one of the oldest of the mechanical pursuits of man, may be considered from its economic and social side, its relation to power, its general mechanical problems, or the principles employed in the mill itself or some of its parts. We are here concerned almost exclusively with the mechanical principles as exemplified in the mill, or that part of the equipment used in the reduction process.

When the origins of settled agriculture built upon grain are found, there we may look for the beginning of some form of grain-milling device. Since no important civilization has been developed without grain, the mill has ever been the handmaiden of material culture. Indeed, the makers of the first mills have been called the first mechanical engineers. Certainly grain milling "may claim rank among the first fruits of man's inventive genius." In tracing the evolution of the milling device, it must be kept in mind that while it has been elaborated and improved it has ceased to be the whole mill as in the case of the muller, for example, and has become one among many devices, such as cleaners, tempering bins, purifiers, and aspirators, in a modern flour mill.

The stand of rolls and the hammer mill represent the art today in the milling of flour and the grinding of feed. These two milling units come to us by two distinct lines of development, which, with a minor third, represent the principal lines of technical progress in milling. This article will recount the fortunes of each of these "First Families in Milling" by pointing out the succeeding generations, showing wherein modifications have been

¹ This article appeared with the same title and fourteen illustrations in *Mechanical Engineering*, 57:611-617 (New York, 1935), and is here reprinted with the permission of the American Society of Mechanical Engineers and the author. The illustrations are by the courtesy of the Museum of Science and Industry, Chicago.

The ancestry of grain milling devices

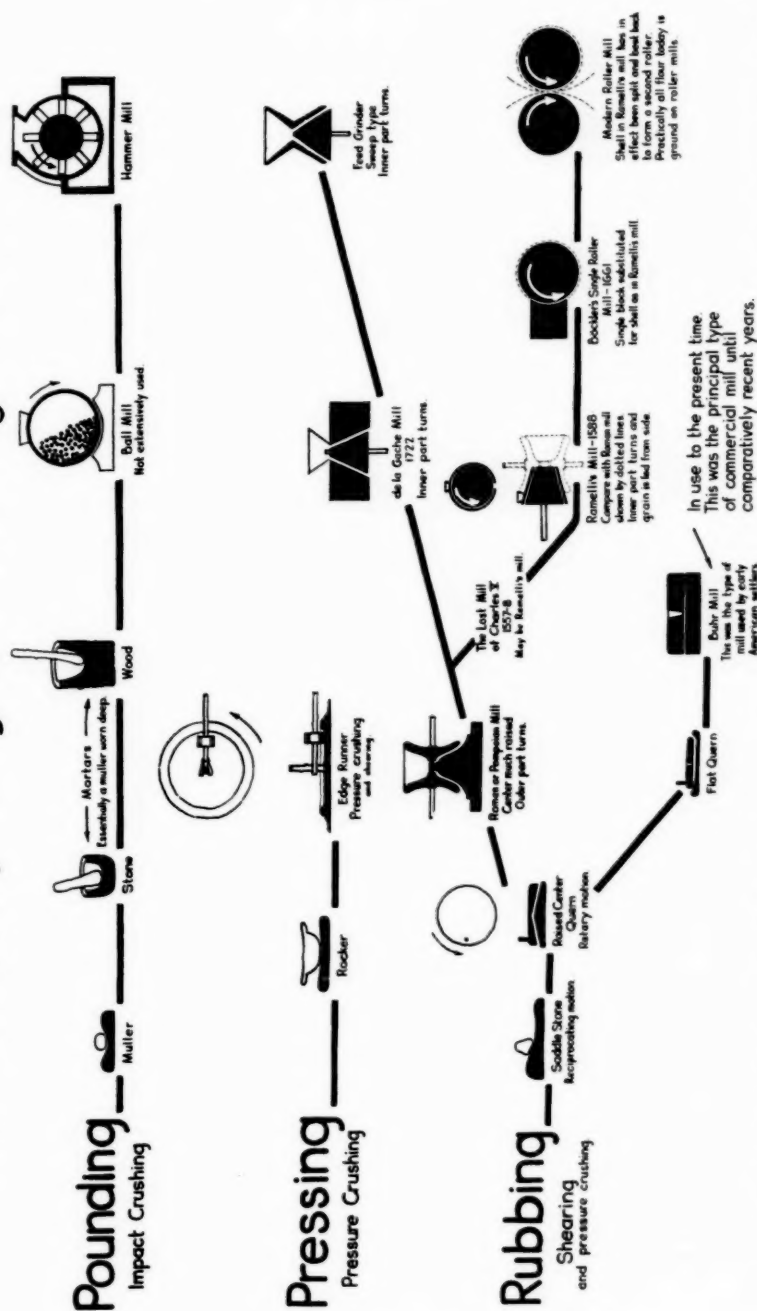


FIG. 1. This chart showing "First Families in Milling" parallels the text and outlines graphically the development of the principal types of milling devices. It was prepared by the author in connection with the milling exhibits of the Museum of Science and Industry, Chicago.

made and indicating the rise or fall of the importance of each type of mill. In some cases we can say with reasonable certainty that one mill did develop from another, but in other instances we can only point out their similarities and differences, the known facts about their use, and leave the direct connection to inference. In treating the subject, we shall follow the line of thought expressed in Figure 1, which may be consulted in connection with the text.

GRAIN-MILLING DEVICES DEVELOPED ALONG THREE MAIN LINES

The three lines along which the milling device has developed are those of pounding or impact crushing, pressing or pressure crushing, and last and most important, rubbing, involving a combination of shearing and pressure crushing. Of these, pounding is the oldest, dating from the Old Stone Age. The distinguishing feature of this kind of grinding is the sudden application of force—as contrasted with the slower pressing—by which the grain is ruptured and reduced to flour or meal. We may say with some certainty that the first milling device—if we except the human molar—was a form of pounding mill which is generally called a muller. In this mill, which may or may not be portable, there is a slight hollow in the stone into which the grain is put and crushed with a handstone. Doubtless the origin of this simple device was the use of a handstone to crush seeds on a flat rock. Perhaps continued pounding wore a small cavity, and man learned that the grain in this hollow scattered less under the impact than on a flat stone, and he continued to make mullers in this form. At any rate, it is found among the artifacts of the Old Stone Age. It has been found in Asia, Europe, Africa, and the Americas, and is used to grind pigments for war paints as well as grain. Originally the under stone was often a large boulder or ledge of stone, but eventually man learned the advantage of making it smaller so that he might more readily take it with him as he moved about.²

² The best single work on the history of milling is the four volumes by Richard Bennett and John Elton on the *History of Corn Milling* (London, 1898). Volume 1, covering the simpler mills, has been of especial value in the preparation of this article.

From the muller it is but one step to the mortar which is essentially a muller worn deep. It seems so reasonable that continued operation of a muller—particularly in soft stone—would naturally result in a gradually deepening cavity that we may accept this, in the absence of written records, as the origin of the mortar. As the cavity deepened, the handstone lengthened until it became a pestle as we know it. The mortar was more difficult to make than a muller and, because of its size, more difficult to transport, but its greater capacity and convenience of operation commended it. Stone and wood were common materials for making mortars in most if not all parts of the world. Americans are familiar with not only the stone mortars of the southwestern Indians but also the wooden mortars used by the Indians of the wooded sections and by the early white settlers. With the latter it was a stopgap for producing meal or flour until they could erect some form of a buhr mill.

The mortar has been used throughout the world and is still to be found in use among the more primitive peoples. In a simple life where the demands are not great, it serves a useful purpose despite its obvious limitations of output. It may be interesting to point out the long-continued use of the mortar and pestle—the symbol of the apothecary—in the drug trade and of the gold stamp, which is only gradually being replaced for the crushing of ore.

But this line, so early founded, soon reached its apparent peak in the mortar and ceased to develop in the milling field. The mortar reached its limit of perfection and marked time while its rival, the saddle stone, and its descendants, which used rubbing or shearing and pressure crushing, rose to predominance unchallenged until recently and still unshaken in the production of flour.

RECENT REVIVAL OF INTEREST IN IMPACT CRUSHERS

The family of impact crushers, despite its seeming limitations, had possibilities which have recently been brought out. From the standpoint of the flour miller, the lesser of these examples is the ball mill which had its origin in other industries. Rotating cylindrical drums of wood or thin plates of metal in which were

placed iron balls were early used in indigo and gypsum mills.³ From the middle of the nineteenth century, they were used in ore grinding and now are extensively used in metallurgy and cement manufacture. About sixty years ago they were used in flour milling but were abandoned until recent years when they have again been tried out experimentally.

The device has been found to have some definite limitations when applied to the reduction of a soft material carrying the percentage of moisture found in wheat. Under the impact of the balls, particularly in large, rapidly revolving cylinders, the material tends to become a sticky mass through which it is difficult to force enough air to take out the fine material as produced without blowing over material not yet ready to go. Further experiments with the ball mill and the rod mill are yet to be made before their efficiency as primary grinders is established, but a limited use of the principle is being made today in a variation of the middlings purifier. A small cylinder is rotated slowly so that the balls tumble gently down on the middlings and wear away the bran particles without forming a sticky mass which prevents the bran from being taken off by an air stream.⁴

But it is another relative, the hammer mill, which has revived the family fortune in recent years, particularly in the feed-grinding industry. The modern hammer mill with its rotating arms which strike the grain and crush it so that the ground material falls through a screen needs no further description. It is worth noting that the hammer mill has, in recent years, largely replaced the sweep type of farm feed-grinder which was such a common sight on our farms not many years ago. This sweep mill—see Figure 1—is a declining member of one branch of the rubbing family, which after a long dominance sees its reign in the feed kingdom ended by a machine employing the principle of impact crushing which dates from the use of the simple muller.

³ *Bulletin de la Société d'Encouragement pour l'Industrie Nationale*, 7:170-174, with plate showing the indigo mill of Le Fèvre (Paris, 1808); 33:229-233, with plate showing the gypsum mill of Bret (1834). See also J. J. Precht, *Technologische Encyklopadie*, 10:222-223 (Stuttgart, 1840). This volume contains an extended account of milling technology.

⁴ The author consulted Mr. Carl Dietz, now of Syracuse, N. Y., who has done much experimenting with balls in flour milling.

ANCIENT SADDLE STONE GROUND BY RUBBING

In the New Stone Age the dynasty of the rubbing family was founded by the saddle stone, an example of which is shown in Figure 2. In this mill the pounding action of the muller was replaced by a reciprocating motion. The name is derived from the similarity between the usual shape and that of a saddle. The curved surface usually slopes down and away from the operator who grinds the grain by rubbing back and forth with a handstone. They may or may not be worn down to form a trough. Sometimes, as in the case of the stone from Tell Beit Mirsim in Palestine (about 1000 to 700 B.C.), they are flat, but this shape is not usual. In Central America and Mexico they have short legs.



FIG. 2. The usual form of North American Indian saddle stone.

In all cases, however, the principle is the same. The action is that of shearing or abrasion with some pressure crushing due to the weight of the stone or the pressure applied by the operator. Throughout the whole line of rubbing milling devices the same distinguishing shearing action is found with a varying amount of pressure crushing.⁵

The saddle stone was an important mill throughout the classical ancient world and is the one referred to in *Exodus*, 11:5,—“And all the first-born in the land of Egypt shall die, from the first-

⁵ Bennett and Elton, *History of Corn Milling*, 1:29-86. The Museum of Science and Industry has the stone referred to from Tell Beit Mirsim and several from Southwestern United States.

born of Pharaoh that sitteth upon his throne, even unto the first-born of the maidservant that is behind the mill." It was on such a mill that the patriarch Abraham directed Sarah to "make ready quickly three measures of fine meal" from which to make cakes for the angels, and that Moses referred to when he forbade the taking of either the nether or the upper millstone to pledge because in so doing a man took another's life in pledge. It was widespread also in the Americas and at a much later time in darkest Africa. They are usually light and easily carried about. Its well-nigh universal use among primitive peoples is evidence that despite its limitations it served the people well.

DEVELOPMENT OF THE QUERN FROM THE SADDLE STONE

We ordinarily think of the Romans as lawgivers and builders, but they also made some notable contributions to milling technology. They took the next step beyond the saddle stone when they devised the raised-center quern about the third century before Christ. They used an upper and a lower stone but with a rotary rather than a reciprocating movement. One or two operators, commonly women, sat beside the mill and turned the upper stone round and round while they fed in the grain at the center. The grain as it was reduced traveled around and outward and dropped as flour from the edge of the stone. Here was a primitive device that had extraordinary possibilities of development. Indeed, from it was to come the buhr mill, the sweep type of feed grinder, and the modern roller mill, all apparently so dissimilar. Its shearing action, continuous rotary motion, and steady flow of material with gradual reduction were the elements which led to its development to a dominant position.

The first querns were made with raised centers in order, as thought necessary, to facilitate the outward flow of material and to insure an adequate capacity. It was found, however, that the mill would grind with or without this raised center; and as a result there branched from this point two lines of development.

In one variation of this device the stones were made flat, and the mill became a flat quern. While it was found that the raised center was not essential in the quern, it was learned at least as

early as Roman Briton times that these millstones did better work if they had grooves, the forerunners of the elaborate dressing of later times, to facilitate the working of the fine material outward and increase the capacity of the mill. Practically all querns were made without grooves, however. The flat quern came into common use in Europe, Asia, and northern Africa, but not among the Australians, the natives of central or southern Africa or the American Indians whose milling never advanced beyond the saddle-stone or metate stage. It was such a mill that Christ had reference to in the warning in *Matthew*, 24:41, that "Two women shall be grinding at the mill; the one shall be taken, and the other left."



FIG. 3. Flat quern with clay trough from Palestine.

Some querns were made light, merely for cracking lentils, while most of them were heavy enough to grind flour effectually (Figure 3). As long as the power was furnished by a person sitting beside it, the mill must perforce remain small. As water and wind wheels were developed during the Middle Ages, the querns were enlarged until they became what we know as buhr mills, from 2 to 6 feet in diameter. This was the mill which was common in western Europe from feudal days, when the barons and bishops forced the peasants to give up the quern in order to swell their own revenues as mill owners, until a comparatively few years ago, and which we provincially think of as a colonial mill. Our early settlers ground their meal and flour first by a mortar,

but as soon as possible by a buhr mill driven commonly by a water wheel and occasionally by oxen. This was the mill which was used from the rise of commercial milling both in Europe and America until the time of the extensive use of the roller mill about 1870 to 1880. It was not until the latter year that in the famous Washburn A mill in Minneapolis the stands of rolls replaced the stone buhrs which were, in a technical sense, only three generations removed from the saddle stone. For two thousand years the buhr mill was the standard milling device of advanced peoples.

DEVELOPMENT OF THE ROMAN MILL FROM THE QUERN

We must now retrace our steps to the parting of the ways at the raised-center quern and it will be well to refer to Figure 1 again. While the raised center was discarded by one line—that leading to the buhr mill which was for centuries the most successful—it was retained and accentuated in the Roman or Pompeian mill which the Romans invented about 200 B.C. and which was destined to have a notable development. In the Roman mill—many of which were found when the buried cities of Pompeii and Herculaneum were uncovered—the center was much raised until it took a high conical shape. The upper stone was likewise transformed until it became a shell to which was added a stone top which served as a hopper. As the grain moved downward it was gradually reduced between the converging stones. As in the case of the quern, the upper and outer part, known as the catillus, turned. In the case of the smaller mills the slaves furnished the motive power, but in the large mills, known as *mola asinara*, the power was supplied by beasts.⁶

For a thousand years after the fall of the Roman Empire there was but little change in the technique of milling except the enlargement of the buhr mill, belonging to another branch of the rubbing family as previously described. It is difficult if not impossible to say how much those who developed the later mills drew upon the Roman mill. From an analysis of the elements involved, there appear two diverging lines of development, one

⁶ *Ibid.*, 1:128-184.

leading to the sweep type of feed grinder which has been mentioned before and the other to the modern roller mill.

THE LOST MILL OF CHARLES V

At this point we are confronted with an enigma, that of the lost mill of Charles V. It may be described as a lost mill because our information about it is limited and we cannot be certain of its form. We know, however, that when Charles V abdicated the throne of Spain in 1557, he retired to the monastery of San Geronimo at Juste, Spain, where, during the winter of 1557-1558, he and a mechanic, Iuanelo Turriano, made an iron mill. We are told that this mill was so small that a monk could carry it under his arm, and with it a man could grind as much flour as was necessary for eight men.⁷ Truly this was a weak beginning—undoubtedly a buhr mill of the day could produce much more—but if those who came after Charles followed its pattern, it deserves an honored place as one of the steps leading to the roller mill and perhaps to the sweep-type of grinder.

From the description which we have of this mill there is much reason to believe that this lost mill is none other than that described in 1588 by Agostino Ramelli in his book, *Le Diverse et Artificiose Machine*. No one pretends that Ramelli was the inventor of the many devices pictured and described in this valuable work. Ramelli, like Besson, Böckler, and others, gathered illustrations wherever he could find them and published them without acknowledgment. Ramelli's mill, as seen in Figure 4, consisted of a horizontal iron core in the shape of the frustum of a cone and an iron shell of the same shape. Grain was fed in at the side and ground as the corrugated core was turned inside the shell which was likewise corrugated. This mill, which seems to fit the description of that of Charles V, has some striking resemblances to the Roman mill. Note on Figure 1 the dotted outline of the Roman mill superimposed upon the Ramelli mill. Turn the Roman mill on its side, cut away the hopper (indeed, a perfect

⁷ F. M. Feldhaus, *Die Technik der Vorzeit, der geschichtlichen Zeit und der Naturevölker*, 724 (Leipzig and Berlin, 1914), citing Famianus Strada, *De Bello Belgico* (Leiden, 1643).

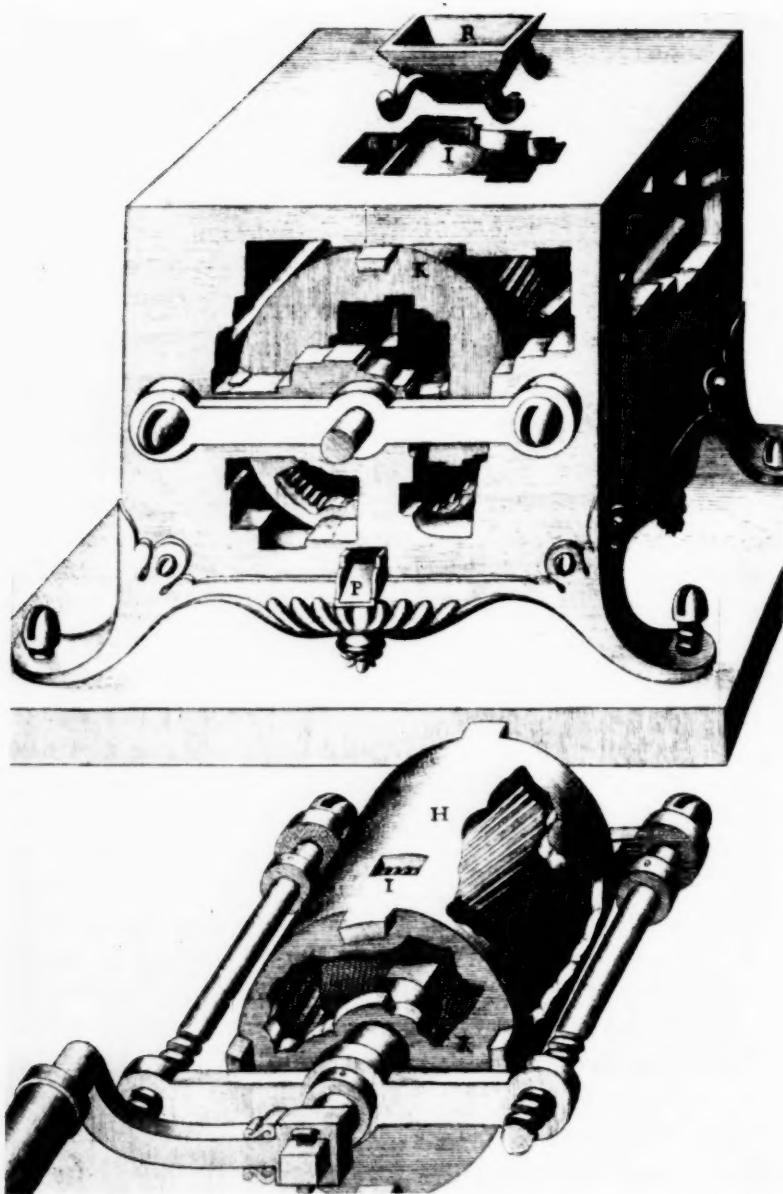


FIG. 4. The Ramelli mill as illustrated in his book, *Le Diverse et Artificiose Machine* (1588)

specimen of the Roman mill found in Britain did not have this stone hopper) and turn the inner rather than the outer part and you have the Ramelli mill in principle. We cannot say, however, that the inventor of this mill, perhaps Charles V, adapted the features of the Roman mill. We can only suggest the points of similarity.

Incidentally, a mill similar to Ramelli, sold in the United States in 1859. It had a fluted horizontal cylinder of white cast iron

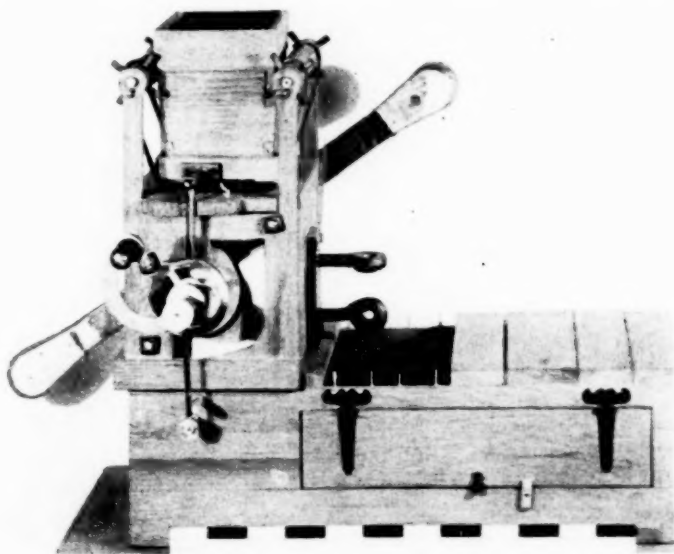


FIG. 5. This quarter-size model of the Bockler single-roller mill was made from the illustration in his book, *Theatrum Machinarum Novum* (1661). A portion of the side of the mill has been removed to show the roller and block.

operating in a case which had a fluted concave below and vibrating flanges above.⁸

In the following century, in 1661, Bockler published in his book, *Theatrum Machinarum Novum*, a collection of plates and descriptions of mechanical devices, in which was shown a mill (Figure 5) which has a distinct similarity to Ramelli's mill in one important particular. The inventor may have concluded that, although

⁸ Catalog of Emery Brothers, Albany, N. Y., 1859.

the grain might be carried round and round in that mill, a part of the cone was not being fully used and might be eliminated. In any event instead of a shell, as in the Ramelli mill, a concave block of stone was used against which a stone cylinder ground the grain, both shearing and crushing it as it worked down through the narrowing space. The grinding action must now take place as the grain passes a few inches of the stone-block face.⁹

EVOLUTION OF THE ROLLER MILL

Now we come to the roller mill as we know it. In the evolution which we have traced, the center of the quern has, in effect, been pulled up and through the upper stone until it has become a cylinder, and the upper stone has now become a shell. Grain is ground between these two parts due to the differential between their speeds. The fact that one part remains stationary does not alter that fact. Suppose that one splits the shell of the Ramelli mill (represented in part by the concave block of Böckler) and bends it back as indicated on the chart to form a second cylinder. What was before the inner grinding surface of a shell now becomes the outer grinding surface of a second cylinder. In this case the output of the mill is increased by running the two cylinders at different speeds. The varying corrugations of the rolls and running of these rolls sharp to dull, dull to dull, etc., are details which need not concern us here. Thus from the saddle stone through the raised-center quern, the Roman mill, the Ramelli mill, the Böckler mill, and the modern roller mill there seems to run a thread of relationship.

We have traced one of the two lines which from a technical standpoint seem to branch from the Roman mill. The other is somewhat less important, but it raises an interesting question. The de la Gâche mill of 1722 consisted of a vertical roughened

⁹ E. H. Knight, *American Mechanical Dictionary*, 2:1021 (Boston, 1876), has an illustration of such a mill having a stone roller and stone concave. See the Supplement for an illustration of a mill with a steel cylinder and steel concave used in Switzerland for cracking wheat. A similar mill is described by Prechtl in *Technologische Encyklopädie*, 10:168-169. See also M. F. Gätzschmann, *Die Aufbereitung*, 1:564-567 (Freiberg, 1860); and *American Miller*, 22:426 (Chicago, 1894). The Museum of Science and Industry, Chicago, has a mill of this type which was manufactured in the United States about 1900.

iron frustum of a cone turning in a corrugated-iron shell with a metal hopper as shown in Figure 6. It is very much like the Roman mill in form but in this case the inner rather than the outer part turns. On the other hand, it is essentially the Ramelli mill raised to a vertical position with a hopper added. Perhaps the former derivation is more logical but it is quite possible that it may have come from the mill of Charles V or Ramelli. Any statement would be pure conjecture and both views might be held



FIG. 6. The de la Gâche mill of 1722. Note the cutaway section showing the vertical grinding cone. This quarter-size model is one of the exhibits of the Museum of Science and Industry, Chicago.

with much reason. The principle has been used in the common sweep-type feed grinders, which have been referred to as having given way to the hammer mill. This branch of the family has not been an important one.¹⁰

CHILEAN PRESSURE CRUSHING MILL

The third family of milling devices—not numerous or well defined—may be distinguished, for the want of a better name, by

¹⁰ "Petit Moulin Inventé par M. de la Gâche," *Machines Approuvées par l'Académie Royale des Sciences*, 4:37-38 (Paris, 1735).

the term, pressing, since their action involves pressure not applied sharply as in impact crushing, but more slowly so that the grain is ruptured by mashing rather than by shearing. The simplest mill of this type is the rocker, a specimen of which was found by Flinders Petrie in Egypt and which he thought to be a form of saddle stone. Bennett and Elton considered it a very curious implement and, if a grain stone, quite unique. Its use as a grain mill seems to be confirmed, however, by the use today among the Indians of the Peruvian highlands of a grinding stone which is very similar in shape. There the operator places grain, in this case maize, on a flat rock and reduces it to meal by rocking the stone back and forth, stopping occasionally to rake together the scattering grain and meal. It is possible that there is a slight shearing action if the stone is twisted as it is rocked, but this does not seem to be the case.¹¹

The edge runner or Chile mill has been widely used for many purposes, one of the lesser ones being for flour milling. It consists of a cylinder, usually of stone, large or small, narrow or wide, placed on a shaft and rolled about a pivot. Here the action is both pressure crushing and shearing. Where the stone is narrow and large in diameter and turning upon a relatively large radius there is a minimum of side slipping and shearing but where the stone is small and wide and close to the pivot it will necessarily slip a great deal and in doing so shear the grain as well as mash it.

Thus has man developed and elaborated this very important device, the mill. In some cases the adaptation has doubtless been made consciously, whether or not we can prove the point, while in others the mechanical experience of the race, diffused and widely varying, has been crystallized into a new form of mill, the ancestry of which may not be entirely clear.

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¹¹ Bennett and Elton, *History of Corn Milling*, 1:54-55. A motion-picture film in the collection of the Museum of Science and Industry, Chicago, shows the use of a mill of this type. The *American Miller*, 26:394 (1898), has an illustration of a similar Bolivian mill which is rocked back and forth by means of a long pole fastened across the top.

THE BEGINNING OF PUBLIC AGRICULTURAL EXPERIMENTATION IN AMERICA

THE TRUSTEES' GARDEN IN GEORGIA

Even the gentle folk who regarded the thirteenth English colony along the Atlantic Coast chiefly in terms of philanthropy could hardly fail to be concerned with the economic development upon which its eventual success depended. If Georgia could not justify her existence as a self-supporting entity, the charitable as well as the imperialistic aspects of the enterprise were doomed to ultimate failure. As to the ability of the colonists to prosper on that favored land between the Savannah and the Altamaha rivers little or no doubt was entertained.¹ In a region where, it was believed, almost any plant ranging from north temperate to tropical would thrive, the problem seemed to be largely one of selection.² The imperialists agreed with the humanitarians that it would be well to commit this most southern of the coastal colonies to the production of those commodities which Great Britain was forced to import from southern Europe, with distressing effect upon her balance of trade.³ It was also hoped

¹ [Benjamin Martyn], "Reasons for Establishing the Colony of Georgia . . . with Some Account of the Country, and the Design of the Trustees (London, 1733)," in the Georgia Historical Society, *Collections*, 1:204-238. Hereafter, this set of 9 volumes in 11 (Savannah, 1840-1916) is cited as *Collections*.

² Savannah lies in latitude 32° 5' north, at a distance of 18 miles from the coast, and at an elevation of 42 feet above sea level. The average growing season as officially compiled from 1872-1937 is 272 days, extending from Feb. 27 to Nov. 26. During the 67 years of which the average was compiled the range in growing season was from a maximum of 360 days to a minimum of 220 days. See U. S. Department of Agriculture, Weather Bureau, *Annual Meteorological Summary with Comparative Data, 1937, Savannah, Georgia*, compiled by W. A. Mitchell (Savannah, 1938).

³ Martyn, "Reasons for Establishing the Colony of Georgia," *Collections*, 1:205, and "An Impartial Inquiry into the State and Utility of the Province of Georgia (London, 1741)," *ibid.*, 160. See also H. B. Fant, "The Labor Policy of the Trustees for Establishing the Colony of Georgia in America," *Georgia Historical Quarterly*, 16:2 (Savannah, 1932).

that certain rare medicinal herbs which were difficult to obtain anywhere at any price could be produced in Georgia.⁴

The chief economic hope of the "Trustees for establishing the Colony of Georgia in America" was the production of silk.⁵ True, the silk industry had failed dismally in Virginia and later in South Carolina, to be supplanted in the former by tobacco and in the latter by rice.⁶ Undismayed by these examples, however, the Trustees long clung to a confident hope that silk would become and remain the basic product of Georgia—that the silkworm would justify his reputation as a "Profitable Insect."⁷

A chain of theoretical advantages was woven to support the silk idea. Georgia would, without competing with her sister colonies, supply Britain, or even all of Europe, with silk by underselling the peasants of Italian Piedmont who were required to pay a toll for their silkworms and a high price for the mulberry leaves with which to feed them. This, in addition to erasing the unfavorable balance of £300,000 to £500,000 annually, would provide employment for twenty thousand persons in the production of raw silk in Georgia for about four months of each year and for a like number of unemployed indigents in England in its manufacture the year around. Silk raising, unlike the culture of rice, was such that women and children could be employed rather than Negro labor.⁸ This was in accord with the ideals of

⁴ Martyn, "Impartial Inquiry," *Collections*, 1:164.

⁵ *Ibid.*, 160; [J. E. Oglethorpe], "A New and Accurate Account of the Provinces of South Carolina and Georgia (London, 1733)," *ibid.*, 68.

⁶ W. B. Stevens, "A Brief History of the Silk Culture in Georgia," in T. M. Harris, *Biographical Memorials of James Oglethorpe, Founder of the Colony of Georgia, in North America*, Appendix 28, p. 391-392 (Boston, 1841); L. C. Gray, *History of Agriculture in the Southern United States to 1860*, p. 23-24, 53-54 (Washington, 1933).

⁷ Oglethorpe, "New and Accurate Account," *Collections*, 1:68; *The Colonial Records of the State of Georgia*, 1:364 (Atlanta, 1904-1915). Hereafter cited as *Colonial Records*, referring in each instance to those of Georgia. A pamphlet entitled *A Compendious Account of the Whole Art of Breeding, Nursing, and the Right Ordering of the Silk-Worm* (London, 1733) was dedicated to the Trustees.

⁸ Martyn, "Impartial Inquiry," *Collections*, 1:160-162, "Reasons for Establishing the Colony of Georgia," *ibid.*, 209-210, and "An Account, Showing the Progress of the Colony of Georgia, in America, from Its First Establishment (London, 1741; Annapolis, 1742)," *ibid.*, 2:280; Oglethorpe, "New and Accurate

the Trustees, who were determined to close the frontier colony to Negro slavery; the "sooty sons of Afric," it was thought, would prove a menace in times of expected clashes with the Spaniards in Florida, and the institution of slavery would aggravate the indolence which characterized some of the early settlers.⁹ Furthermore, Sir Thomas Lombe, a silk expert whose opinion had been solicited by the Trustees,¹⁰ asserted that silk culture in Georgia had "a very great probability of succeeding, if . . . proper measures are pursued, and such assistance afforded to the poor people at their first setting out, as are necessary to settle, instruct and encourage them."¹¹

The production of wine figured second only to silk in the dreams of the Trustees. Georgia, it was pointed out, is situated in the same latitude as Madeira, and it was believed that wine of a comparable quality could be produced.¹² In addition to wine and silk, Georgia was expected to produce flax, hemp, and potashes, which were then being imported chiefly from Russia. It was also believed that the remarkable new colony could supply England with indigo, cochineal, olives, and drugs of various kinds.¹³ In short, to quote Professor E. Merton Coulter: "Just

Account," *ibid.*, 68-69. For a brief history of the industry in Georgia, see M. T. McKinstry, "Silk Culture in the Colony of Georgia," *Georgia Historical Quarterly*, 14:225-235 (1930).

⁹ *Colonial Records* (By-laws and Laws), 1:49-52; Martyn, "Account, Showing the Progress . . . of Georgia," *Collections*, 2:280-281. The phrase "sooty sons of Afric" is from William Bartram, *Travels Through North and South Carolina, Georgia, East and West Florida . . .*, 310 (London, 1792).

¹⁰ *Colonial Records* (Minutes of Trustees), 1:97; Martyn, "Account, Showing the Progress . . . of Georgia," *Collections*, 2:283.

¹¹ Martyn, "Reasons for Establishing the Colony of Georgia," *Collections*, 1:206-207, and "Account, Showing the Progress . . . of Georgia," *ibid.*, 2:283. See Sir Thomas Lombe to Trustees, Old Jaory, Jan. 31, 1732, *ibid.*, 311-312.

¹² [William Stephens], "A State of the Province of Georgia, Attested upon Oath in the Court of Savannah, November 10, 1740 (London, 1742)," *ibid.*, 2:76; Martyn, "Reasons for Establishing the Colony of Georgia," *ibid.*, 1:212. For brief secondary treatment, see Gray, *History of Agriculture in the Southern United States*, 190.

¹³ *Colonial Records* (Minutes of Trustees), 1:364; Martyn, "Reasons for Establishing the Colony of Georgia," *Collections*, 1:210-212; Oglethorpe, "New and Accurate Account of South Carolina and Georgia," *ibid.*, 51, 68; Martyn, "Impartial Inquiry," *ibid.*, 163-164.

as all the virtues in the human category were to blossom out of these former human wrecks so should spices and silks and the mellowest wines flow from this magical garden."¹⁴

To aid in determining and effecting the economic destiny of Georgia, James Edward Oglethorpe, founder of the colony, was instructed by the Trustees to establish a public garden. While this institution would supplement the private gardens of the settlers in providing needed vegetables, its principal purpose was twofold: to serve as an experiment station in testing out plants best adapted to the soil and climate of Georgia; and to constitute a nursery to furnish seeds, particularly young mulberry trees and vine cuttings, for planting in the farms and gardens of the colonists in order to carry out the predetermined culture of silk and wine.¹⁵

On February 12, 1733, Oglethorpe landed Georgia's first English settlers at Yamacraw Bluff, the present site of Savannah, and immediately began the arduous task of founding the new colony. Before the month had passed, the location for the public garden had been chosen.¹⁶ The place selected probably would have been an excellent home site, but its utility as a garden plot was open to question. It comprised 10 acres on Savannah's bluff, immediately east of the settlement, and included the clayey slope eastward to a marsh, as well as a small section of the marsh.¹⁷ Near the northwest corner of the garden site was an Indian mound, or tumulus, of uncertain age but with interesting traditions.¹⁸ The sandy, dry soil of the bluff, which constituted about

¹⁴ E. M. Coulter, "When John Wesley Preached in Georgia," *Georgia Historical Quarterly*, 9:319 (Savannah, 1925).

¹⁵ Martyn, "Account, Showing the Progress . . . of Georgia," *Collections*, 2:286; B. S. Hart, "The First Garden of Georgia," *Georgia Historical Quarterly*, 19:325 (Savannah, 1935); L. M. Cooney and H. C. Rainwater, *Garden History of Georgia, 1733-1933*, p. 368 (Atlanta, 1933).

¹⁶ W. B. Stevens, *A History of Georgia, from Its First Discovery by Europeans to the Adoption of the Present Constitution in MDCCXCVII*, 1:115 (New York, 1847); Hart, "First Garden of Georgia," *Georgia Historical Quarterly*, 19:325.

¹⁷ Francis Moore, "A Voyage to Georgia, begun in the Year 1735 . . ." (London, 1744), *Collections*, 1:98. Pagination in original pamphlet, 33 *et. seq.*

¹⁸ J. G. W. De Brahm, *History of the Province of Georgia: with Maps of Original Surveys*, 37 (Wormsloe, 1849). See particularly De Brahm's "Plan of the City SAVANNAH and Fortification" (c. 1760) between p. 36-37.

one half of the area of the garden, was described by one critic as "a poor bit of sand which, in the heat of summer, would have roasted an egg."¹⁹ The clay slope was better adapted to horticulture, and at the base of the slope lay a rich garden mold, which, however, was in need of draining.²⁰

Notwithstanding the questionable selection of land, work upon the public garden went ahead rapidly during the early weeks; the ground was laboriously turned up with the heavy hoes then in use; and soon wheat, pot herbs, leeks, sage, thyme, celery, corn, peas, potatoes, and cabbage were planted to supply the settlers with vegetables pending the time when they might prepare their own homestead plots.²¹ Concurrently with this emergency gardening, the permanent plan for the garden was worked out and gradually put into effect. The acreage was fenced, and a suitable gate built at the entrance. An esthetic feature of the garden was the planting of orange trees along the cross walks which divided the garden into numerous squares. Thus planted, they would still serve their experimental purpose and at the same time provide shade, and in blossom time, a delightful fragrance for those who might stroll along the walks. In the northern part of the garden was left, in its original condition, an impressive grove of hickory, live oak, American ash, bay, sassafras, and magnolia trees.²²

The connection of the garden with the silk industry was clearly indicated by the many squares which were devoted to the raising of white mulberry trees (*Morus alba*); any planter in the colony was entitled to receive young plants free of charge from this public nursery. In the most exposed part of the garden, experiments were made with fruits of the homeland, such as apples,

¹⁹ Moore, "Voyage to Georgia," *Collections*, 1:98, J. L. Agnew and F. D. Lee, *Historical Record of the City of Savannah*, 12 (Savannah, 1869). The allegation appears as a quotation in this work, but its source is not indicated.

²⁰ Moore, "Voyage to Georgia," *Collections*, 1:98; *Colonial Records* (Egmont's Journal), 5:630.

²¹ This method is described by Gray, *History of Agriculture in the Southern United States*, 195; Hart, "First Garden of Georgia," *Georgia Historical Quarterly*, 19:325; and Harris, *Biographical Memorials of Oglethorpe*, 128.

²² Moore, "Voyage to Georgia," *Collections*, 1:98; Adelaide Wilson, *Historic and Picturesque Savannah*, 7 (Boston, 1889).

pears, and peaches, and the sections that were more sheltered from the withering blight of the north winds were used for the cultivation of olives, figs, vines, pomegranates, and "such Fruits as are natural to the warmest Parts of Europe." At the base of the bluff, an especially sheltered section with some of the best soil in the plot was reserved for experimentation with tropical and sub-tropical plants. This section contained, according to one visitor:

a collection of West India plants and trees, some coffee, some cocoa-nuts, cotton, Palma-christi, and several West Indian physical plants. . . . There is a plant of Bamboo cane brought from the East Indies . . . which thrives well. There was also some tea seeds, which came from the same place; but the latter, though great care was taken, did not grow.²³

Even before the garden site had been selected, and indeed before the *Anne*, bearing the first group of settlers, had left the shores of England, much interest had been shown in the agricultural and botanical possibilities of the new colony. On August 17, 1732, the Trustees had voted to prepare a book for entering subscriptions "for the Incouraging & Improving Botany and Agriculture" in Georgia, and at their next meeting, six days later, had agreed to a preamble under which the subscribers' signatures would be placed.²⁴ Certain scientists and patrons of science entered their pledges of annual payments toward the advancement of botany and agriculture for a period of three years. These contributors were Sir Hans Sloane, the Duke of Richmond, the Earl of Derby, Charles DuBois, the Company of Apothecaries of London, George Heathcote, and Lord Peters. Oglethorpe and the Trustees as an organization made donations. The Earl of Derby's subscription was for £50 annually "towards the Improvement of Five Hundred Acres as a Farm for Experiments of all kinds."²⁵

²³ Moore, "Voyage to Georgia," *Collections*, 1:99-100.

²⁴ *Colonial Records* (Minutes of Trustees), 1:72.

²⁵ *Ibid.*, 122-123, 142, 160, 164, 173, 217, 249, 252, 254; (The General Account of all Monies and Effects), 3:14, 51, 83, 112. Sir Hans Sloane (1660-1753) was an eminent physician of his day. He was physician to the Governor of Jamaica, 1687-89; secretary of the Royal Society, 1693-1712, and president, 1727-41; foreign member of the academies of sciences at Paris, St. Petersburg, and Madrid; presi-

With the funds thus raised and promised, Doctor William Houston, a competent botanist, was retained in October 1732, on a three-year contract to search for plants to be introduced into Georgia's public garden. His salary was to be £200 a year, payable semi-annually—£150 by the Trustees and the remainder directly from Lord Peters as his contribution.²⁶ Houston had outlined a plan of travel and search for plants which would take him to Madeira, Jamaica, Cartagena, Porto Bello, Campeche, and Vera Cruz. He believed that he could complete his travels in about a year or a year and a half and then spend the remainder of his contracted term in Georgia supervising the planting and culture of the exotics which he had collected. The botanist presented the following plan of procedure:

1st To take his Passage in the first Ship that shall Sail from the River for Jamaica, by the way of Madera. While the said Ship lyes at Madera (which will be probably about three weeks) he designs to inform himself of the manner of cultivating the Vineyards and making the wines there, and to carry with him to Jamaica Cuttings of . . . any other usefull Plants he shall meet with on that Island, which are wanting in our American Colonies.

2^d He intends to go from Jamaica to the several Spanish Colonies at Cartagena, Puerto Bello, Campeche & Vera Cruz, and for that end begs of the Hon^{ble} Trustees, to procure for Sir John Eyles and others of the Directors of the Hon^{ble} South Sea Company Letters of Recommendation to their respective Factors, that they may assist him in obtaining what he goes about. . . .

dent of the Royal College of Physicians, 1719-35; first physician to George II, 1727; to Christ's Hospital, London, 1694-1730; purchased manor of Chelsea in 1712 and founded the Botanic Garden there, 1721; published works on West Indian plants; his collections were purchased by the Government and placed in the Montague House (afterward the British Museum), 1754.—*The Dictionary of National Biography (Concise)*, 1209 (London, "published since 1917"); S. A. Allibone, *A Critical Dictionary of English Literature and British and American Authors . . .*, 2:2120 (Philadelphia, 1870). Charles DuBois (d. 1740) was treasurer of the East India Company and was noted for his cultivation of exotics at Mitcham in Surrey.—*Dictionary of National Biography*, 366; *Colonial Records (Minutes of Trustees)*, 1:123, 2:174.

²⁶ *Ibid.*, 2:6. William Houston or Houston (1695?-1733) had received his M. D. at Leyden in 1729; was Fellow of the Royal Society; and had collected plants in the West Indies and Venezuela and published two botanical works in that field. He was honored in the name of the genus *Houstonia* of the Madder Family.—*Dictionary of National Biography*, 647; Allibone, *Critical Dictionary*, 1:898; Asa Gray, *Manual of Botany . . .*, 223 (ed. 6, New York, 1889).

3^d He proposes to Stay at each of these places as long as shall be found necessary for obtaining all that can be gott from them; and upon his Return from one of them to Jamaica; to leave the Plants he shall bring over, with the Person he shall Judge most capable and willing to take care of them, while he goes to the remaining Places in Search of others.²⁷

Having drawn half of his first year's salary in advance, Houstoun seems to have embarked upon his quest at the earliest opportunity. On November 9, 1732, he wrote from Madeira that he had already sent two tubs of Malmsey and other vines to Charleston for delivery to Georgia. He embarked the following day for Jamaica, where his useful activities were ended by death soon after his arrival.²⁸

On March 6, 1734, Robert Millar was appointed to succeed Houstoun during the remainder of the three-year term, "for procuring such useful Plants and Drugs in the Spanish West Indies to be propagated for the Improvement of Botany & Agriculture in Georgia."²⁹ Some two months later, Millar embarked on the *St. Thomas*, bound for Jamaica. After establishing his headquarters at Kingston, he set out, August 20, 1734, on his first search for rare medicinal herbs for the Georgia colony. Arriving ten days later at Porto Bello in Central America, he made his way across the Isthmus to the town of Panama. In this vicinity he had hoped to obtain specimens of "*Jesuits Bark*" and balsam of Peru but found that they grew too far from the city to

²⁷ *Colonial Records* (Minutes of Trustees), 2:5-6.

²⁸ *Ibid.*, 1:96, 2:6; (General Accompt of all Monies and Effects), 3:54; Cooney and Rainwater, *Garden History of Georgia*, 368. See also Martyn, "Reasons for Establishing the Colony of Georgia," *Collections*, 1:212.

²⁹ *Colonial Records* (Minutes of Trustees), 2:60; [Robert Millar], "A Narrative of my Proceedings in the Several Voyages and Journeys made pursuant to the Instructions I Received from the Hon^{ble} The Trustees for Establishing the Colony of Georgia in America dated the 8th of March 1733/4 for procuring such useful Plants and Drugs in the Spanish West Indies to be propagated for the Improvement of Botany & Agriculture in Georgia," July 7, 1736, *Colonial Records* (Original Papers, Correspondence, 1735-37), 21:191-195. Hereafter referred to as Millar's Report. The name sometimes appears as Miller, but the best sources indicate Millar as the spelling. Harris, in *Biographical Memorials of Oglethorpe*, 129, wrote: "The Doctor [Houstoun] having died at Jamaica, the celebrated botanist Philip Miller was now his successor." Philip Miller was the botanist at Chelsea Garden and should not be confused with Robert Millar.

be accessible. After collecting such seeds and plants as he was able to find in the environs of Panama, he returned to Porto Bello and thence back to Jamaica. Soon he sent to England, in care of Philip Miller, botanist at the Chelsea Botanic Garden, certain seeds and plants for distribution among the subscribers and "to sow and preserve Such as should be found useful for being sent to propagate in Georgia."³⁰

There followed one of several rather protracted intervals of inactivity before another journey was undertaken. On January 22, 1735, Millar boarded the *Don Carlos* for an expedition to Cartegena in the present Republic of Colombia. He arrived about a week later and set out for the town of Mompos on the Magdalena River, about a hundred and fifty miles to the southeast, in search of *Ipecacuanha* and *Balsamum copaiva*. Failing, he turned his steps southwestward and at Ayapel, almost one hundred miles from Mompos in the present province of Bolivar, he found not only these, but several other rare plants. Transplanting his finds in boxes, the Trustees' botanist sent them to Cartegena, himself returning to that port by way of Tolu where he discovered a few additional specimens. At Cartegena he immediately boarded the *Don Carlos* and returned to his headquarters in Jamaica.

Millar, not being able to secure immediate transportation of the seeds and plants to Georgia, decided to transplant the *Ipecacuanha* plants and to sow the seeds of the balsams of *Copaiva* and Tolu in two gardens at Jamaica and to leave them in care of "two Careful Persons." The trip to Colombia had been a rigorous one. Millar complained that "Great fatigue & many Inconveniencies which attended that long & Expensive Journey . . . so much Impaired my health, that I was not Capable of taking another for Several Weeks after my arrival in Jamaica."³¹

³⁰ Millar's Report, *Colonial Records*, 21:191-193. "*Jesuits Bark*," more commonly known as Peruvian bark, is the bitter bark of a South American tree (genus *Cinchona*) from which quinine is obtained. Balsam of Peru, used as a stomachic and expectorant, is derived from a tropical American fabaceous tree (*Toluiifera pereirae*).

³¹ *Ibid.*, 192-193. *Ipecacuanha*, commonly called "ipecac," is a tropical plant (*Uragoga ipecacuanha*), the root of which is used medicinally as an emetic. Bal-

Meanwhile he planned a third expedition which would take him to Campeche and Vera Cruz in Mexico, where he hoped to obtain, among others, specimens of jalap, contrayerva, cochineal plants and insects, and the seeds of the gum elemi tree.³² On November 28, 1735, he was able to secure passage for Campeche aboard the *Charming Sally*, arriving at the Mexican port on December 10. Millar's searches in the region of Campeche were rewarded with discoveries of contrayerva and trees of the species which produce elemi. There were no seeds on the latter at that season, and apparently finding no young trees suitable for transplanting, the botanist made arrangements with a local priest to forward some seeds at the next season.

Without returning to his base in Jamaica, the traveling botanist boarded a Spanish ship at Campeche for Vera Cruz, whence he hoped to travel inland to procure jalap, cochineal, "& Several other usefull Drugs." However, upon his arrival in the harbor he was confined aboard ship by order of the admiral, Don Manuel Lopes Pintado. Through the intervention of the English factors of the South Sea Company, he was allowed to land, but Pintado insisted that Millar must leave Vera Cruz on the first Spanish man-of-war to sail or forfeit all of his baggage. The botanist chose to leave and sailed the following day for Habana where he

samum copaiva is obtained from several species of the genus *Copaiva*, a tree native to South America and Africa, and is used as a stimulant and diuretic. Balsam of Tolu, used as a stomachic and expectorant, is a fragrant balsam obtained from a South American tree (*Toluidra balsamum*).

³² Millar to Trustees, Kingston, *Colonial Records*, 21:68, 193. Jalap is the purgative, tuberous root of certain Mexican plants, especially *Exogonium purga*. Sarsaparilla, a species of smilax, is a well-known mild tonic and alterative. Contrayerva, in this instance, probably referred to *Dorstenia contrayerva*, the aromatic root of which is a stimulant, tonic, and diaphoretic. The same name is also applied to a West Indian plant (genus *Aristolochia*) of like properties and uses. Literally contrayerva means counter herb, i.e. an antidote. Cochineal is a scarlet dyestuff composed of the dried bodies of female insects (*Coccus cacti*) indigenous to Mexico and Central America. The host plant is the "cochineal fig" (*Nopalea cochinellifera*). The cochineal dye was formerly supposed to be the seed of this plant, but it is apparent from Millar's mention of cochineal "Animals" as well as plants, that he did not hold this false idea. Gum elemi is a fragrant oleoresin obtained from various tropical trees and is used in making varnishes and medicinally in ointments and plasters.

transferred to a homeward-bound English vessel, the *Constant*, "whereby," as he later wrote, "my present Return to England was Occasioned."³³

Due partly to the ineffective and slow means of communication at that time, and partly to Millar's neglect of his correspondence, the Trustees had not been regularly informed of the travels of their botanist. In fact, payment of his salary for the Christmas quarter, 1735, had been "postponed till Advice shall arrive of the said Millar's being alive at the end of said quarter."³⁴ Shortly thereafter came a letter from Millar, whereupon it was ordered that a quarter's salary be paid him "as soon as the subscriptions for him came in."³⁵

It was while the Trustees were taking this action that the botanist was having his unfortunate experience with the Spaniards at Vera Cruz. On July 5, 1736, he appeared in person before the board to report and claim his past-due salary. The Trustees were disappointed that he had brought with him no seeds or plants for introduction into Georgia, but Millar assured them that he had left the specimens at Jamaica, "where he hears they thrive."³⁶ The original subscriptions expired in October 1736, but the contributors agreed to extend their payments for two years, and Millar's contract was renewed for that period in order that he might have an opportunity "to get his things settled in Georgia, from his nursery in Jamaica."³⁷

Returning to Kingston early in February 1737, Millar inspected the *Ipecacuanha* which he had left growing there, found it satisfactory, and promised to send some to Georgia the following month. Hoping to avoid a repetition of his former embarrassment at Vera Cruz, he awaited certain credentials which he

³³ Millar's Report, *Colonial Records*, 21:193-194.

³⁴ *Colonial Records* (Minutes of Trustees), 2:140.

³⁵ Earl of Egmont (Viscount Percival), *Diary of the First Earl of Egmont*, 2:221 (London, 1923).

³⁶ *Ibid.*, 288-289; *Colonial Records* (Minutes of Trustees), 2:163.

³⁷ Egmont, *Diary*, 2:306. The statement in Cooney and Rainwater, *Garden History of Georgia*, 368, to the effect that Millar was not reappointed is erroneous. Philip Miller to Harman Verelst, Accountant to the Trustees, Chelsea, Nov. 7, 1735, in *Colonial Records*, 21:38.

expected from Count Montejo, Spanish nobleman and patron of science, before proceeding again to that place. By July, he had received the desired letter, but apparently was unable to get passage. Soon afterward he became ill, but discouraged and weary, he still watched in vain for a ship to Vera Cruz. Months passed, and in October, Millar wrote his brother to let him know that he was still alive, although his death had been reported

once or twice lately, & indeed wth some reason; for I have had the severest Sick-ness . . . that I ever had . . . I no sooner recover a little Strength but I again relapse. I have had Fevers of all the different kinds, almost Known in this Country off & on for these 4 Months past; violent & low [*long?*] continued Fevers, Quotidians, Tertians, & Quartans.³⁸

Not until December 1737 did the luckless botanist have an opportunity to sail to the inhospitable Mexican port to resume his search for jalap and cochineal. On the eve of his departure he apologetically expressed the hope that "I shall be more Successful in this Trip, than I was in my former."³⁹

The hopes of the botanist proved vain, for his second trip was as complete a fiasco as the first. As quaintly expressed by the victim, "The little Hardships, & Cruel usage I . . . underwent was somewhat Severe." Upon his arrival at Vera Cruz, he applied to the viceroy for permission to travel in the province, which, notwithstanding his credentials, was refused. Millar was ordered to return to Jamaica by the same ship on which he had arrived, but it did not sail from Vera Cruz until two months later, and during that period the unfortunate Millar was confined within the walls of the town, without change of clothing, toilet articles, or even his much-needed medicine—all of which were held on the ship.⁴⁰

Upon his return, with defeated plans and wounded ego, he informed the Trustees that he could see "no manner of Purpose" in continuing his search, "having already mett with so many Rubs

³⁸ Millar to Trustees [*probably*], Kingston, in *Colonial Records*, 21:281-282; copy of letter from Robert Millar to Andrew Millar, Oct. 28, 1737, transmitted to Verelst, Jan. 14, 1738, *ibid.*, 516-517.

³⁹ Millar to Trustees [*probably*], in *Colonial Records*, 22 (1): 25-26; Millar to Verelst, London, Mar. 18, 1738, *ibid.*, 110-111.

⁴⁰ Millar to Trustees, May 26, 1738, *ibid.*, 150-152.

and Dissappointments." He intended to return to England but, if the Trustees desired, he would first go to Georgia with some plants he had collected, and supervise their planting. After thus writing his employers he settled back and awaited instructions.⁴¹

The Trustees replied, rather sharply, that they would be glad if he would proceed to Georgia with his collections, "but having been long subscribers to him, and having seen no fruits of our expense, but a disappointment of our expectations, we could not be at the charge of sending him." There is no record that Millar made the trip. He returned to England from Jamaica in the early fall of 1739 and "gave . . . no satisfactory Acct of the roots plants &c he was employ'd to collect in America for Georgia." Later, he advised the Trustees that Georgia might produce indigo profitably, and hinted rather broadly that he would consider a position in obtaining it and supervising its planting.⁴²

Throughout the four years of his botanical reconnaissance, Millar seems to have been interested chiefly in securing rare medicinal herbs and botanical curiosities for planting in Georgia's experimental garden. In that regard he had only indifferent success, but he was able to obtain *Balsamum copaiva* and *Ipecacuanha*. However, all of his travels and search led to the conclusion that "there was no getting the Jesuits bark." Millar's second contract expired at midsummer, 1738, and was not renewed.⁴³

Meanwhile, friends of the Georgia experiment were sending offerings of exotic, but more practical, plants for the Trustees' Garden. Thomas Hyam sent six olive trees from Venice and some currant vines from Zante in 1734, fifty caper plants in 1735, some Neapolitan chestnuts for "sowing in Georgia" in 1736, and a box of caper plants from Marseilles and a tub of cuttings of vines of Lippora raisins and currants in 1737. The gardener at the Chelsea Botanic Garden supplied white mulberry seeds from

⁴¹ *Ibid.*; Egmont, *Diary*, 2:506.

⁴² *Colonial Records* (Egmont's Journal), 5:63, 65-66, 229; Egmont, *Diary*, 2:506. See also *Colonial Records* (Minutes of Trustees), 1:362; George White, *Historical Collections of Georgia* . . . , 17-18 (New York, 1855).

⁴³ Egmont, *Diary*, 2:187; *Colonial Records* (Egmont's Journal), 5:229.

Italy, two papers of "Egyptian Kali" or potash seed, one paper of cotton seed, and one tub of white mulberry plants and Burgundy vines in 1733; one paper of white mulberry seed from Italy in 1734; and a tub of madder roots in 1735. In the latter year Robert Adams also sent his offering, a parcel of bamboo seed, and Christopher Tower sent a keg of lucerne or alfalfa seed. The following year saw donations of a bag of barilla seed from Spain, three or four large tubs of bamboo plants from the East Indies, and another large tub of bamboo plants,—the benefactions of Solomon Merrett, Samuel Skinner, and Richard Martyn, respectively. In 1737, William Cook sent sixteen different varieties of vine cuttings from France; and Charles King, two tubs of vines.⁴⁴

The public garden at Savannah had a checkered career; sometimes thriving, sometimes desolate, sometimes neither. The beginning seems to have been auspicious. Under Oglethorpe's supervision and the immediate direction of the gardener, one Joseph Fitzwalter, employed at the expense of the Trustees, the early progress was encouraging.⁴⁵ In 1734, a visitor noted that "The honorable trustees have a beautiful garden . . . consisting of ten acres, where are a great many white mulberry trees, vines, and orange trees raised."⁴⁶ An account from the pen of Commissary Von Reck, temporal leader of the Georgia Salzburgers, observed:

there is laid out near the Town, by Order of the Trustees, a Garden for making Experiments for Improving Botany and Agriculture; it contains 10 Acres and lies upon the River; and it is cleared and brought into such Order that there is already a fine Nursery of Oranges, Olives, white Mulberries, Figs, Peaches, and many curious Herbs: besides which there are Cabbages, Peas, and other European Pulse and Plants which all thrive.⁴⁷

⁴⁴ *Colonial Records* (Minutes of Trustees), 1:130, 168, 215, 220, 237, 239, 259, 277, 293; *ibid.* (General Accompt of all Monies and Effects), 3:59-60, 124, 126, 153, 177-178, 193.

⁴⁵ Egmont, *Diary*, 2:476; *Colonial Records*, 22 (1):229; Cooney and Rainwater, *Garden History of Georgia*, 368. The name appears in the various records as FitzWalter, Fitzwalker, and FitzWater.

⁴⁶ "A New Voyage to Georgia, By a Young Gentleman (ed. 2, London, 1737)," *Collections*, 2:40-41.

⁴⁷ *An Extract from the Journal of Mr. Commissary Von Reck and of the Rev. Mr. Bolzius*, 12-15 (London, 1734).

After Oglethorpe was forced to shift his attention almost entirely to the Spanish frontier and, for that purpose, had established his headquarters at Frederica on St. Simon's Island, the public garden at Savannah began to decline. Sometime in 1735, Gardener Fitzwalter, as a result of a quarrel, left abruptly for South Carolina, and for a time thereafter, the garden was totally neglected. Francis Percy was employed in 1736 and seemed to take an interest in putting the garden in order; soon it began to furnish mulberry trees to the prospective silk producers of the colony. Before a year had passed, however, Percy became involved in a quarrel with Thomas Causton, keeper of the public stores at Savannah, alleging that Causton was cheating him of part of his wages. He, too, left Georgia for South Carolina in the summer or fall of 1737. It was reported by John Wesley, who left the colony in that year, that the public garden "was now under no care and half the trees are dead."⁴⁸

In June 1736, Hugh Anderson received from the Trustees a commission as "Inspector of the Public Garden and Mulberry Plantations." Notwithstanding his rather impressive title, Anderson received no salary, but was later allowed £10 a year "for keeping an Horse." His duties, in addition to supervising the garden, consisted of traveling over the colony to investigate what had been planted on the several farms.⁴⁹

In the following year, and after the departure of Gardener Percy, William Stephens arrived in Georgia to assume his duties as secretary of the colony. He was not pleased with the conditions as he found them and after visiting the private vineyard of Abraham DeLyon, a Portuguese Jew who had successfully

⁴⁸ Egmont, *Diary*, 2:317, 466, 476, 493; Stephens to Trustees, *Colonial Records*, 22 (1):77-78; information from John Wesley, Feb. 8, 1738. A letter from Causton to the Trustees, Apr. 25, 1737, *ibid.*, 21:401, indicates that Percy was at that time still serving as gardener.

⁴⁹ Egmont, *Diary*, 2:278; *Colonial Records* (Minutes of Trustees), 2:275. Anderson did not, as is erroneously stated in Cooney and Rainwater, *Garden History of Georgia*, 368, replace Robert Millar as botanist. The duties of the two men were quite different and they served concurrently from the time of the appointment of Anderson to the end of Millar's second term in 1738.

experimented with viniculture on his garden lot in Savannah, he declared:

nothing had given me so much Pleasure since my Arrival, as what I found here . . . I could not but reflect on the small Progress that has been made hitherto in propagating Vines in the publick Garden, where the Soil being the same, it must be owing to the Unskillfulness or Negligence of those who have undertaken that Charge: And another notorious Instance of it, is that of the Mulberry-Trees.⁵⁰

Despite a general dissatisfaction and neglect of lands throughout the colony, due to the poor crops of 1737, Inspector Anderson seems to have worked conscientiously in attempting to restore the public garden to a flourishing state. On February 14, 1738, he took Bailiff Henry Parker and Secretary Stephens on an inspection tour of the garden, "where," remarked the latter, "I was very glad to see so good a Progress made in putting all into due order again, after the sad Confusion it had been lately in."⁵¹ Fitzwalter returned in December 1737 and was reemployed. As head gardener, he was paid 1s. 6d. for each working day, or about £20 a year. Although he was not permitted to work land for himself, he was allowed to sell seed from the public garden at fixed rates. It was partially through his vigorous direction of the handful of servants assigned to him, abetted by the efforts of Inspector Anderson, that the garden had been "reduced . . . into decent Order again."⁵²

In March 1738, a severe frost blighted the young orange trees, and it was necessary to prune them almost level with the ground. The vines were also damaged, and the mulberry trees were held back by the unseasonably cold weather, the consequent lack of food proving fatal to the earliest of the silkworms. Notwithstanding the inclement weather, the garden was reported "in

⁵⁰ *Colonial Records* (Stephens' Journal), 4:43-44. See also 2:228, 241; *Collections*, 1:164; 2:298.

⁵¹ *Colonial Records* (Stephens' Journal), 4:59, 80-81; The worst drought in several years occurred during the spring of 1737.—Stephens to Verelst, *ibid.*, 22 (2):5. Egmont, *Diary*, 2:476.

⁵² Egmont, *Diary*, 2:476; Stephens to Trustees, in *Colonial Records*, 22 (1):77-78. An inventory of the public garden with comments by Anderson was sent as an enclosure in this letter; unfortunately it has not been found.—*Ibid.* (Minutes of Trustees), 2:275, 418.

good Order" by the end of April; the orange trees had sprouted again; the vines were "in a thriving Way;" and the mulberries "produced Plenty of Leaves." Stephens thought that silk culture would, in this year, begin to show signs of becoming a profitable industry.⁵³ Another observer, in the same month, informed the Trustees "that the Trees in your Garden were most of 'em in a flourishing State So well as the Vines . . . Some few of the Oranges had met with the Tail of a Blight w^{ch}. demolishd numbers In this Province [*South Carolina*]." This writer also shared Stephens' optimism in regard to the silk industry. He had inspected the magazine of silkworms "which lookd very healthy & Sure I am that great Quantitys may soon be produced and provided for."⁵⁴

However, the promises of April proved illusory. A group of foreign indentured servants arrived, and twelve were detailed to work at the stores, the crane, or the public garden "as occasion might require." Stephens wrote, "I think a more lazy, obstinate, & dissatisfyd people, can scarcely be found."⁵⁵ Furthermore, the summer of 1738 was very hot and dry, and in consequence the crops were badly damaged.⁵⁶ By August, Stephens feared that the Trustees' Garden would suffer "a Relapse near to the State I found it in at my first coming; which with some care and Pains was then alterd much, & gave hopes of seeing better things as the Spring came on; but of late I think tis grievously neglected."⁵⁷ Although active for a time in the development of the garden, Anderson suffered a long and incapacitating illness, and Fitzwalter seems to have rested on the laurels earned by his work in the early spring. In the words of Secretary Stephens:

I presume Mr. Anderson wanted no Instructions in what he was to undertake; & as I observ'd he was pretty active for a Season, in directing what he thought needfull . . . but (poor Man^r) he & all his Family have been very long (some Months) in a very weak & sick condition which yet so far continues, as to call for the Prayers of the Church: but the Principal Gardener under him, one Fitz-

⁵³ *Colonial Records* (Stephens' Journal), 4:134; (Egmont's Journal), 5:71, 223.

⁵⁴ Thomas Jenys to Trustees, Charleston, S. C., in *Colonial Records*, 22 (1):137.

⁵⁵ Stephens to Trustees, Savannah, *ibid.*, 262.

⁵⁶ *Ibid.* (Stephens' Journal), 4:156-158.

⁵⁷ Stephens to Trustees, in *Colonial Records*, 22 (1):229.

walter . . . deserves certainly the Character of an Idle Fellow; and as he could never stick long to any thing commendable, he perserveres in the same loose way of Life; w^{ch} I apprehend he'll not easily break from now; having married the Widow of one Wright, who had a License for keeping a Publick House, where he naturally takes most delight.⁵⁸

By the fall of 1738, Oglethorpe, on a visit to Savannah, held out some hope for silk culture in the colony and predicted an increase in production during the following year. "The Italians [*who had been imported to give instructions in the reeling of silk*] begin to like the Place," he wrote the Trustees, "and the family of Cameus [*Camuse*] have wound silk as fine as the last was which was made in Georgia, there are a great many Mulberry Trees in the Garden which begin to recover themselves so that next year they will feed a great quantity of worms."⁵⁹ Again visiting Savannah at the beginning of the silk season, he appeared satisfied with the progress that was being made in the industry, and added that half an acre of vines had been planted in the Trustees' Garden which "have begun to shoot & promise well."⁶⁰ Hardly had Georgia's leader written these words, however, when the public garden "felt severely the effects of . . . cruel Frost about the middle of March." The orange trees again were blighted as were the very young vines, especially those which had put forth the tendrils which had attracted Oglethorpe's attention. Some of the older vines and "such as had taken good Root" were not so seriously damaged and by the middle of May it was noted that "many of 'em shew very promising Clusters." The frost, it was hoped, would prove a test by which the variety of vine best adapted to Georgia's climate might be determined.⁶¹

⁵⁸ *Ibid.* See also *ibid.* (Egmont's Journal), 5:159.

⁵⁹ *Collections*, 3:58-59. Jacques Camuse, his wife, Mary, and their three children were sent to Georgia by the Trustees in 1733 to promote the silk industry in the colony.—*Colonial Records* (Minutes of Trustees), 1:100. Mrs. Camuse, especially, won a considerable reputation as a silk winder.—*Ibid.*, 392; White, *Historical Collections of Georgia*, 18.

⁶⁰ Oglethorpe to Trustees, Savannah, Mar. 12, 1739, *Collections*, 3:71. Oglethorpe's bright hopes in regard to the silk industry were unwarranted. In 1739, he was able to send only 20 pounds of silk to England, whereas he had believed that five times that amount would be available.—Gray, *History of Agriculture in the Southern United States*, 187.

⁶¹ Stephens to Trustees, May 19, 1739, in *Colonial Records*, 22 (2):144-145. A killing frost in Savannah at the middle of March or later is by no means a rarity.

During this period, a group of settlers, dissatisfied with the progress of the colony during the first five years of its existence and believing that "To complain has been always deemed the wretched privilege of the miserable," attempted to discredit Oglethorpe and deprecated practically all the institutions and regulations of Georgia.⁶² These malcontents at first "met constantly at the Tavern" in Savannah, but later some of them left for Charleston where they issued a vitriolic pamphlet opposing the policies of the Trustees and the personality of the leader.⁶³ The best lands, claimed the malcontents, were reserved "under a pretence that they were kept for the vagrant Indians." Violent objection was raised to the regulation prohibiting the importation, use, "or even sight of" Negroes when they were "essentially necessary to the cultivation of Georgia, as axes, hoes, or any other utensil of agriculture." Among a host of other grievances, they complained that land could not be held in fee simple; importation of spirituous liquors was illegal; the building of forts, wharves, light-houses, and other public structures had been neglected; Oglethorpe was acting the part of a despot; and the keeper of the public stores was dishonest and overbearing.⁶⁴

Even the public garden came in for its share of attention from the disgruntled ex-Georgians. "This," they asserted, "was as far from answering the proposed end, as every thing else was; for it is situated upon one of the most barren spots of land in the colony, being only a large hill of dry sand . . . where it is hardly possible for what is planted to live, but impossible to thrive."⁶⁵

During 21 years of the period 1872-1937, the last killing frost in spring is shown as March 10, or later. In 1885, such a frost was recorded as late as April 13.—U. S. Department of Agriculture, Weather Bureau, *Annual Meteorological Summary*.

⁶² Thomas Stephens, "A Brief Account of the Causes that Have Retarded the Progress of the Colony of Georgia in America . . . (London, 1743)," *Collections*, 2:90.

⁶³ *Colonial Records* (Stephens' Journal), 4:111.

⁶⁴ Stephens, "Brief Account of the Causes that Retarded the Progress . . . of Georgia," *Collections*, 2:92-101; Patrick Tailfer, Hugh Anderson, David Douglas, *et. al.*, "A True and Historical Narrative of the Colony of Georgia, in America, from the First Settlement Thereof Until this Present Period . . . (Charleston, 1741)," *ibid.*, 2:198-263.

⁶⁵ Tailfer, Anderson, Douglas, *et. al.*, "True and Historical Narrative . . . of Georgia," *ibid.*, 2:205, 252.

One of the leading spirits among the malcontents was Hugh Anderson who, in October 1739, was removed by Oglethorpe from his position as "Inspector of the Public Garden and Mulberry plantations," ostensibly because of his long illness and as an economy measure. However, as Stephens naively remarked, Anderson had been "the person who wrote that remarkable anonymous letter to Col. Oglethorpe, for taking new measures before the Colony could thrive, w^{ch} gave Mr Oglethorpe so much displeasure." The quondam inspector of the public garden left the colony to settle at Charleston where he delivered lectures on botany. There also he became coauthor of the *True and Historical Narrative*, the most caustic of the verbal attacks on Oglethorpe.⁶⁶

At the height of the word battle something approaching physical violence seems to have occurred within the peaceful park-like groves of the garden. If the testimony of a partisan in the controversy may be credited, in the summer of 1740 a group of malcontents, "went, on a Sunday, in the time of Divine Service, into the Trusts Gardens, broke down the Fence, took y^e Key by force from the Gardeners Wife, kickd at her, [and] threatened to beat the Gard'ner."⁶⁷ At the trial which followed this incident, the Trustees' servants who were in the garden at the time were summoned as witnesses, but it seems that the jury elected not to believe "what such mean pittifull Wretches (who would Swear any thing) should swear against Gentlemen" and the case appears to have been dismissed.⁶⁸

Even the friends of Oglethorpe and the colony could not be enthusiastic regarding the progress of the public garden during this period. In a highly favorable account of conditions in the colony in 1740, the houses, the courthouse, the wharf, the guard-house, the church, and the harbor were given perhaps more than due attention, but of the Trustees' Garden no mention was

⁶⁶ *Colonial Records* (Egmont's Journal), 5:224, and note 64. In Harris, *Biographical Memorials of Oglethorpe*, 198, note, the name is incorrectly given as Hugh Williamson.

⁶⁷ Thomas Jones to Verelst, *Colonial Records*, 23:55.

⁶⁸ *Ibid.* Although Jones did not specifically state that the case was dismissed, his account very definitely points to that conclusion.

made.⁶⁹ In the same year, Secretary Stephens, a loyal Oglethorpe supporter, admitted that the experiment with orange trees had proved unfortunate for there were "very few young ones alive, either in the publick Garden, or in any private about us, in Spite of all our Care." Even more positive, though perhaps ill-advised, was the statement of Thomas Jones to the effect that "no oranges grow nearer than Amelia to the southward," that is, in northern Florida. Thomas Causton testified that the public garden was in "bad condition," except for the mulberry trees.⁷⁰

The latter statement is significant in the history of this first agricultural experiment station, for it marks the period when its permanent decline began. From that time on, the experimental objectives of the public garden were subordinated to the supporting of the pre-determined production of silk and wine, soon deteriorating into a mulberry and vine nursery, then merely mulberry, and finally disappearing with the impracticable industries which, in its later years, it was solely designed to promote.

Early in 1740, there seems to have been a wave of interest in viniculture in the colony, but there was an unfortunate lack of cuttings, the public garden not being particularly well endowed in this respect.⁷¹ The olive trees in the garden, it was reported late in 1741, "make large shoots, but have not yet bore fruit."⁷² In the following year, the Secretary informed the Trustees "That the Publick Garden at Savannah being the most part of it poor ground the trees and plants in it were decaying, but he had dreignd the lower part of it which proves a very valuable spot."⁷³

⁶⁹ Martyn, "Account, Showing the Progress . . . of Georgia," *Collections*, 2:307-308.

⁷⁰ *Colonial Records* (Stephens' Journal), 4:521-522; Jones to Thomas Lyde, Savannah, *Collections*, 1:199; *Colonial Records* (Egmont's Journal), 5:344. Stephens, Jones, and Causton were all staunch adherents of the pro-Oglethorpe faction.

⁷¹ *Colonial Records* (Stephens' Journal), 4:515.

⁷² Thos. Causton to Trustees, Savannah, *ibid.*, 23:157. See also Stephens to Trustees, *ibid.*, 22 (2):453, in which it is stated that the public garden had five olive trees, described as "grown Plants of 5 or 6 foot high, very beautifull." No mention is made of fruit.

⁷³ Quoted in *Colonial Records* (Egmont's Journal), 5:630. The word "decaying" was probably loosely used by Stephens for dying; inasmuch as the plants were suffering from a lack rather than excess of moisture, it is not probable that they were literally decaying.

While uninterested "Trust servants worked shamefully" on the poorly selected land that constituted the public garden, certain freeholders of Savannah and vicinity were earnestly experimenting on their private acres, "curious . . . to find what the Soil was most fitly adapted to."⁷⁴ Abraham DeLyon was widely, and it seems justly, famed for his successful testing of vines imported from Portugal, and at least ten other private experimenters in the same field can be listed.⁷⁵ Experiments in the production of cotton were undertaken in 1740 and 1741 by William Stephens on his 5-acre town garden, and by Dr. Patrick Graham at Mulberry Grove, his plantation at Joseph's Town.⁷⁶ Stephens also planned to raise oranges on his Vernon River plantation, and experimented with indigo seed from the West Indies. He was pleased to find his neighboring planters "busy in propagating Vines," but added, "I wish I could say raising Bread too, as well as Wine."⁷⁷

By this time the Trustees' Garden had become almost solely a nursery for white mulberry trees to be furnished gratis to all planters of the colony who desired them, and the fact that certain planters could, at times, raise young mulberries and sell them at a profit is sufficient commentary upon its inadequacy. In 1741, even Oglethorpe was forced to purchase six thousand young mulberry trees from Graham's Mulberry Grove plantation in order to begin the silk industry at Frederica, Georgia's outpost on St. Simon's Island. Also indicative of a change in the policy and purpose of the Trustees' Garden, was an application, in the

⁷⁴ *Ibid.*, 687; (Stephens' Journal), 4:85. For description of the status and rewards of the "Trust servants" see Gray, *History of Agriculture in the Southern United States*, 98; Fant, "Labor Policy of the Trustees," *Georgia Historical Quarterly*, 16:1-16.

⁷⁵ *Collections*, 1:164; 2:298; 3:71; Causton to Trustees, Savannah, *Colonial Records*, 23:157. Some of these were: Adrian Loyer, James Baileu, James Papot, Samuel Mercer, William Stephens, Noble Jones, Thomas Causton, Henry Parker, Edward Bush, and Joseph Fitzwater.

⁷⁶ *Colonial Records* (Stephens' Journal), 4:535, 541; Thomas Jones to Oglethorpe, *ibid.*, 23:38. Dolores Boisfeuillet Floyd's 43-page typewritten ms., "Mulberry Grove Plantation, near Savannah," is the only secondary account of Mulberry Grove. One copy is in the Georgia Case, Main Library, Savannah.

⁷⁷ *Colonial Records* (Stephens' Journal), 4:521; (supp.):155, 192.

same year, for mulberry leaves rather than plants.⁷⁸ By 1742, Graham had made "50£ by mulberry seeds which he collected at Puryburg [*South Carolina*], and after putting them in his ground, and letting them rest till they shot up as big a straw, sold them to his Neighbours at a penny a plant."⁷⁹ In addition to Graham, Lewis Camuse, the silk winder, and Thomas Causton had mulberry groves; others had planted them, but having left them to the mercy of roving cattle, they had been largely destroyed.⁸⁰

The public garden seems to have survived, as a mulberry nursery, until 1747 or 1748. In the late summer of 1745, the secretary wrote: "Not a Year passes, but I take Care to provide good Quantities of Mulberry Plants for all who are ready to use 'em, as well as continually to encrease the Store of 'em in the Publick Garden."⁸¹ But John Gerar William De Brahm, His Majesty's Surveyor-General for the Southern Colonies, who arrived in Savannah in 1751, noted that "this usefull undertaking had been for some years abandoned." On the site of the garden he found only "two large Olive Trees, some Sevil Orange, Apple, Plumb, Peach, Mulberry, honey Locust, one Apricok and one amerel Cherry Tree as Testimonies of the laborious Experiments and good Successes." He was told of "many other successful Experiments," but all trace of them had passed away before his arrival.⁸²

On February 4, 1755, John Reynolds, Georgia's first Royal Governor, petitioned his council for a personal grant of the 10 acres "laying East of Savannah and formerly (tho' very unfit

⁷⁸ Oglethorpe to Trustees, *Colonial Records*, 23:131-132; James Lewis Camuse to Trustees, Savannah, *ibid.*, 24:201-202. That such a practice later was adopted is indicated in Stephens to Martyn, Aug. 29, 1744, *ibid.*, 297.

⁷⁹ *Colonial Records* (Egmont's Journal), 5:587-588.

⁸⁰ Causton to Trustees, *ibid.*, 23:156.

⁸¹ Stephens to Martyn, Savannah, *ibid.*, 24:297, 415. Evidence of the activity in the propagation of the white mulberry (*Morus alba*) in the public garden and the private gardens of Georgia was noted by Stephen Elliott. Although the white mulberry was a native of China and Persia, it had become entirely naturalized. "Around the plantations in the low country it occurs, I think, more frequently than our native species [*Morus rubra*]."—Stephen Elliott, *A Sketch of the Botany of South-Carolina and Georgia*, 2:574 (Charleston, 1824).

⁸² De Brahm, *History of the Province of Georgia*, 11, 20, 39-40.

for the Purpose) laid out for a Publick Garden commonly known by the Name of the Trustees Garden." It was immediately granted to the Governor, who apparently intended to develop it as a residential section.⁸³ Houses were built on the site, and in 1760, a road was cut through the Indian mound to effect communication between the new suburb, appropriately named Trustees' Garden, and Savannah proper. DeBrahm reported that this suburb, and another called Yamacraw, located to the west, added "above 160 Houses . . . to the Number of Houses in the City."⁸⁴

For some years after the abandonment of the garden, the Trustees still clung to their hope of making Georgia a silk-producing colony. When forced to retreat from their position on other Utopian features, they attempted to turn the concessions to the advantage of the favored industry. For example, in 1749, when they were compelled to yield to the importunities of those who desired Negro slavery in Georgia, the following clause was added to the law allowing that institution:

AND WHEREAS great Advantages may arise to the Inhabitants of the said Colony of Georgia and to the British Nation by the Culture and raising of Silk within the said Province BE IT THEREFORE FURTHER ENACTED that every Planter . . . who shall at any time hereafter have or keep any Male Negroes or Blacks shall have and keep for every four Male Negroes or Blacks one Female Negroe or Black and so in proportion. . . And that every such Planter shall instruct such their Female Negroes or Blacks or cause them to be well instructed in the Art of winding or reeling of Silk from the Silk Balls or Cocoons . . . every Planter within the said Province shall plant five hundred Mulberry Trees on every five hundred Acres of land . . . and so in proportion.⁸⁵

The next year saw the appointment of one Joseph Ottolenghe, a native of Piedmont, to promote the culture of silk in Georgia, at a time when the colonists other than the Salzburgers of Eben-

⁸³ *Colonial Records* (Proceedings and Minutes of the Governor and Council), 7:101.

⁸⁴ De Brahm, *History of the Province of Georgia*, 37-38. This portion of Savannah constitutes a ward which is still called "Trustees' Garden" officially, although the name is not in common use. Trustees' Garden ward is bounded on the west by East Broad Street; on the south by Broughton; on the east by Randolph; and on the north by Bay.—Map of the "City of Savannah and Vicinity 1935" by A. S. Goebel, City Engineer, Savannah.

⁸⁵ *Colonial Records* (By-laws and Laws), 1:60.

ezer had practically given up the industry.⁸⁶ A filature was built at Savannah, and silk production made some degree of progress, reaching its peak in 1766 with 20,380 pounds of cocoons from which were secured some 1,080 pounds of raw silk. With the reduction of the bounty, however, the industry declined until, in 1771, the filature discontinued operations, the building being used thereafter for public meetings ranging from balls to church services.⁸⁷

The silk and wine industries which were to have made Georgians prosperous had failed to materialize.⁸⁸ Still there remained the indubitable fact that Georgia was endowed with a more equable climate than were the colonies to the northward. Her colonists had turned to the cultivation of rice, indigo, maize, hemp, and tobacco, but these could be produced as well, or in some instances more successfully, in certain other colonies.⁸⁹

⁸⁶ *Ibid.* (Minutes of Trustees), 1:552; Stevens, "Brief History of Silk Culture in Georgia," 397; *Colonial Records*, 1:528-529; 25:passim; De Brahm, *History of the Province of Georgia*, 21-22. The silk industry seems to have been most successful when conducted by compact, well-organized, and disciplined religious communities such as the German Lutheran Salzburger at Ebenezer. In later years, some success was attained by the Shakers of New York, and more particularly, by those of Kentucky.—U. P. Hedrick, *A History of Agriculture in the State of New York*, 275 (Albany, 1933). The Mennonites in certain western States and the Mormons in Utah were also rather successful.—L. O. Howard, "The United States Department of Agriculture and Silk Culture," U. S. Department of Agriculture, *Yearbook*, 1903, p. 140-144.

⁸⁷ Stevens, "Brief History of Silk Culture in Georgia," 399, 407, 410-411. The record was attained after the bounty had twice been reduced and the industry, in consequence, had been abandoned by many. The production record was due to unusually favorable conditions prevailing during the season of 1766. The amount dropped almost 50 percent in the following year and thereafter rapidly declined until the silk industry became non-existent in Georgia. For a table showing exports of silk from Savannah, see Gray, *History of Agriculture in the Southern United States*, 187. See also De Brahm, *History of the Province of Georgia*, 22.

⁸⁸ Although silk culture was virtually over forever in Georgia by the 1770's, there was a reawakening of interest in the industry when the *Morus multicaulis* craze swept the country in the 1830's. Savannah, according to Stevens, "Brief History of Silk Culture in Georgia," 413, "did not escape, and for a time the fever raged, with much violence, but the febrile action soon subsided, leaving no permanent benefit." For a general statement, see Howard, "U. S. Department of Agriculture and Silk Culture," 138.

⁸⁹ De Brahm, *History of the Province of Georgia*, 22.

There remained the problem—to the solution of which the Trustees' Garden had been dedicated in its early years—of finding the products for which the climate of Georgia was optimum.

After the Trustees Garden had come to mean a hamlet rather than an agricultural experiment station, and the site was assuming the built-up appearance it has today, certain zealous horticulturists continued to experiment with exotics. In 1763, for example, De Brahm tried to grow pineapples which he claimed "took Root and grew . . . and so did a Coco-nut." He also experimented, as did others in the colony, with Tartarian rhubarb which, with extremely careful handling, was made to grow. Other planters attempted the culture of plantain, papaw, and sugar cane. With the latter they were partially successful, for, while it did not mature sufficiently to permit the manufacture of sugar, in its unripened condition it was found suitable for making rum.⁹⁰

When William Bartram, eminent botanist and son of one still more eminent, made his celebrated Southern journeys in the 1770's, there was evidence that the spirit of botanical and agricultural experimentation fostered by the public garden had not died out in Georgia. Bartram was delighted by the "spacious gardens . . . with a variety of fruit trees and flowering shrubs," which he found on the plantation of Jonathan Bryan, about eight miles up the river from Savannah. He remarked particularly "in a low wet place at the corner of the garden, the Ado (*Arum esculentum*)" a plant with a "large Turnip-like root, which when boiled or roasted, is excellent food, and tastes like the Yam."⁹¹

Occasionally seeds were still received from England. In 1770, John Ellis, the agent for West Florida whose headquarters were at Gray's Inn, London, sent some rhubarb seed to Georgia. Thirty-five years earlier such a gift undoubtedly would have been turned over to the gardener at the Trustees' Garden. That institution having long been abandoned, the donor sent the seeds

⁹⁰ *Ibid.*, 43-44.

⁹¹ Bartram, *Travels through North and South Carolina, Georgia, East and West Florida*, 467.

to James Habersham whom he knew as an influential man. Habersham, having no great interest in experimental agriculture, distributed the rhubarb seed "among a, Number of Gentlemen" more concerned with horticulture.⁹² At that time, according to Habersham, John Mulryne had "the neatest and best Garden in . . . this part of the Province, and really delights in cultivating usefull and ornamental Plants of all kinds." Josiah Tattnall had a "tolerable Garden, but has no particular passion for improving it further than for the Market and his Table," while Nathaniel Hall and Thomas Netherclift had "little useful Gardens." Jonathan Bryan had "a general knowledge of this Province and So Carolina, and of its' many unnoticed, tho' perhaps usefull Plants—both medicinal, and ornamental," and James Jackson of Augusta "has got a pretty Garden, and delights in its' Improvement."⁹³

All trace of the public garden of Savannah, laid out over two hundred years ago by Georgia's great founder and watched with interest by friends on both sides of the Atlantic, has been lost for well over a century. The site today is hardly one of beauty, nor is it one to suggest progressive agriculture. The Indian mound which constituted a part of it has been entirely levelled and a gas works is the most prominent landmark on the site where once orange trees blossomed and exotic shrubs stirred the curiosity of the inquiring mind.

Something of the spirit of the Trustees' Garden seems, however, to remain. Perhaps, as suggested in a recent study of the garden, "its beauty and service became a mystical force that blossoms today in a thousand Georgia gardens."⁹⁴ Certain it is that the efforts of some of Georgia's earlier gardeners were inspired, at least in part, by the community garden on the Savannah. De-Brahm, who arrived too late to see it as an actuality, heard stories of the horticultural wonders performed there, and there is no

⁹² Habersham to Ellis, *Collections*, 6:91-92.

⁹³ *Ibid.*

⁹⁴ Hart, "First Garden of Georgia," *Georgia Historical Quarterly*, 19:332. That Georgians have not entirely forgotten the Trustees' Garden is clearly shown by the fact that the Trustees' Garden Club is now (1938) an active organization in Savannah.

doubt that he, as well as others of his time, was influenced by the accounts of the Trustees' Garden, which even at that early day was beginning to assume mythical qualities.⁹⁵

The public garden, in company with other ideals of the founders of Georgia, retreated with the advance of the inexorable socio-economic forces which decreed that the plantation system, with its cotton, rice, and slaves, and not the intensive production of silk, wines, spices, and drugs by freemen, should prevail. The destruction of that system under tragic circumstances again brought the need for agricultural experimentation to determine the successor of King Cotton. Despite its industrial, rather than agricultural emphasis, the Herty Foundation Laboratory in present-day Savannah is no very distant cousin of the Trustees' Garden.⁹⁶

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⁹⁵ De Brahm, *History of the Province of Georgia*, 37-40.

⁹⁶ The Herty Foundation Laboratory, known as the Savannah Pulp and Paper Laboratory before February 28, 1938, is a quasi-public institution where, under the direction of Dr. Charles H. Herty, experiments are conducted looking toward the development of new industries for Georgia and other Southern States. The Legislature of Georgia, in its recent special session, passed an act setting up the foundation and authorizing the body to accept gifts and appropriations as well as contributions such as equipment and supplies for the experimental laboratory. It also appropriated \$20,000 for the purpose.—*Savannah Morning News*, Mar. 1, 1938, p. 14.

SEVENTEENTH-CENTURY MARYLAND PRICES

The scarcity of organized and published price data for Maryland during the seventeenth century encourages the presentation of the following material. The figures are most fragmentary in comparison with the long continuous series offered in some studies of American prices in the eighteenth century, and after working with the subject, one can appreciate the decision of the International Committee on Price History to omit seventeenth-century America from its studies.¹ The accompanying series, however, do contribute some much-desired data to the economic history of the century.

For the most part the prices given in this study are from the original manuscript records of Maryland in the Hall of Records at Annapolis,² and are the appraised values of inventories from many properties. These appraisals of the property of deceased persons were made by official appraisers whose reports became a part of the county records for the protection of parties concerned. There is, unfortunately, an absence of reliable infor-

¹ Anne Bezanson, Robert D. Gray, and Miriam Hussey, *Prices in Colonial Pennsylvania* (Philadelphia, 1935), and *Wholesale Prices in Philadelphia, 1784-1861* (Philadelphia, 1936); H. M. Stoker, "Wholesale Prices at New York City, 1720-1800," Cornell Agricultural Experiment Station, *Memoir 142*, part 2 (Ithaca, 1932); G. R. Taylor, "Wholesale Commodity Prices at Charleston, South Carolina, 1732-1791," *Journal of Economic and Business History*, 4:356-377 (February 1932); and scattered quotations of prices in P. A. Bruce, *Economic History of Virginia in the Seventeenth Century* (New York, 1895); W. B. Weedon, *Economic and Social History of New England, 1620-1789* (Boston, 1890); L. C. Gray, *History of Agriculture in the Southern United States to 1860* (Washington, 1933).

² The most fruitful sources were the *Testamentary Proceedings*, 1 (1657-1666), 2 (1666-1668); and the *Inventories and Accounts*, 1 (1674-1703), 2 (1676), 3 (1676-1677), 4 (1677), 8 (1682-1685), 9 (1686-1688), 13 (1694-1696), 14 (1696-1697), 15 (1697-1698). A few items came from the printed *Maryland Archives* (1663-1666), 49:350-591, and from the manuscript Provincial Court Records, FF (1665-1669). Page references for the prices in the tables are not given as they were taken from the sources page by page. So far as known, there are no account books and newspapers of seventeenth-century Maryland.

mation concerning the relation of appraised values to market or store prices. The items are such, however, that, except in the case of pewter, there is no reason to attach a used, and therefore depreciated, value different from the exchange value. Inventory appraisals were made for small and large estates, and when there was a store on the plantation, merchandise from that source was at times so designated. In some lists the quantity indicates that the goods were for sale. There is no measurable difference in the values attached to such store merchandise and the commodities kept on hand for personal use, though occasionally large quantities received a slightly shaded price. No data are used that give any indication of forced sales. The records for different counties over four decades involved different individuals as appraisers, and this diversity of official estimates offers possibilities of counterbalancing personal idiosyncracies and local customs.

The three-year periods in each of the four decades are selected because of the greater adequacy of the material for these dates and because, in the history of colonial Maryland, the middle years of the respective decades were relatively the least disturbed by colonial and royal changes affecting the economic life of the Province. The selection of three years in each decade also allows a somewhat arbitrary balance between adequate price data for frequency distribution and a period sufficiently brief to minimize critically disturbing events.

With very few exceptions, all of the reported appraisals of the thirty items in the four three-year periods are used. It might be inferred that the number of appraisals for each item during the four decades shows the changes in their use and demand in the Province, but there is no factual basis for such correlation. Moreover, there is apparently no consistency in the quantitative trend of the material, even though nice explanations can be made in some cases.

Two requirements are established in the selection of items for this price study. First, they have to be unused (cloth, grains, salt) or of such a nature that the used and exchange values would normally be about the same (slaves, servants, livestock, pewter).

Second, for at least three of the four decades, the number of appraisals has to be sufficient to allow statistical treatment.

The selection of a measure of value common to these four decades presents a problem. For the period 1665/1667-1675/1677, appraisals were reported to the courts in terms of tobacco, and for the following decades in sterling, although claims against estates continued in tobacco as hard money was very scarce in Maryland.³ Sterling is the most desirable unit of measurement, but satisfactory conversion ratios for tobacco and pence have not been found for the first two periods. Only a few tobacco prices in sterling are available for Maryland in the sixties and the eighties, and there is no uniformity. For the last twenty years of the century, however, the books of inventories and accounts contain numerous quotations of tobacco valued at 1d. and 1 1/5d. per pound.⁴ The former ratio is used as it occurs more frequently. Were the latter taken, the result would be a drop of one sixth in the prices for the last two decades.⁵

³ The Maryland colonists tried to get a mint, 1661-1663, but without success. *Archives*, 1:414-415, 444, 468. To encourage the importation of foreign coins, the Assembly passed several acts, 1671, 1686, 1692, that provided for an "advanced" valuation of "all Coynes (except the Coynes of his Royall Maestie the King of great Brittain)." *Ibid.*, 2:286-287, 13:142-144, 186, 188-189, 493-495. See also M. S. Morriss, *Colonial Trade of Maryland, 1689-1715*, p. 28, 105 (Baltimore, 1914), and C. P. Nettels, *The Money Supply of the American Colonies before 1720*, p. 162-178 (Madison, 1934).

⁴ Nor is there much information in London about the prices of Maryland tobacco at the plantation. In a letter to the author, dated at London on May 14, 1937, Miss M. E. Rayner, secretary of the International Scientific Committee on Price History, says that they have "collected very few tobacco prices, and none at all until the end of the seventeenth century. What information [they] have is mainly from Custom House sales of forfeited goods. These records give a great variety of prices but not always for specified kinds; only Virginia tobacco occurs with any sort of regularity."

⁵ Tobacco prices per pound: 1665-67,—1 1/5-1 1/2d. (Gray, *History of Agriculture in the Southern United States*, 264); 1 1/2d. (*Archives*, 49:388, and *Testamentary Proceedings*, 2:241); 1 3/4d. (*Archives*, 49:440). 1675-77,—1d. (*Archives*, 2:407; *Inventories and Accounts*, 2:227, 3:50); 1 1/5d. (*ibid.*, 2:320); 1d., 1 1/5d., 1 1/2d. (*ibid.*, 1:233, 262, 296, 350, 432, 560). 1685-87,—many references are in *Inventories and Accounts*, volumes 8-9, the majority being 1d. The same ratio is dominant for 1695-97, although 1 1/5d. is frequent. See *ibid.*, 13 and 14. Morriss, *Colonial Trade*, 38, gives the price range from 1 1/2d. to 2d. for 1697-99; and the U. S. Department of Agriculture *Yearbook*, 1908, p. 683, gives 3.09 cents in

Six of thirty frequency distribution tables are presented in this article. Numbered 1 to 6, they are good samples for quantity of data, price trends, and distribution of appraisals. In the construction of these tables, the price intervals for the respective items are selected as far as possible to place the middle points in coincidence with the most frequently used tobacco and sterling prices.⁶

Table 7 contains two groups of calculations. The first gives the arithmetic means and medians as tobacco price averages for each of the thirty items. For the mean, the mid-point of each price class is multiplied by the number of appraisals in that class. The sum of the products is then divided by the total number of appraisals. Although the totals of the appraised items are not used in the computations, they are offered in the six basic tables for information. For the medians, the original prices when in sterling are arranged in order of magnitude and the middle point converted into tobacco at the rate of 1d. for a pound of tobacco.

The second group of figures in Table 7 affords two price indexes for each of the thirty items. The one in Roman type is calculated from the arithmetic means and the other, in italics, from the medians. For each the simple average of the respective means and medians of the four three-year periods is taken as the base. Furthermore, the items are placed in natural groups and the price relatives for each index are averaged to give a trend for that group. Finally, to establish a movement for all thirty items, the medians for both indexes are given in Table 8.

Part of the pleasure—and danger—in such price studies lies

1664, 4.12 cents in 1684, and about 3.10 cents for the rest of the century. See also Gray, *History of Agriculture in the Southern United States*, 263-267; V. J. Wyckoff, *Tobacco Regulation in Colonial Maryland*, index (Baltimore, 1936).

⁶ Although the responsibility for the final organization of the material is the author's, the statistical methods were discussed by correspondence with Anne Bezanson of the University of Pennsylvania, Arthur H. Cole of Harvard, and George H. Evans, Jr., of Johns Hopkins, and orally with George Bingley of St. John's College. Miss Bezanson and Mr. Cole have generously allowed the utilization of their extensive experience in price studies, and W. L. Crum of Harvard has made suggestions concerning the arrangement of the tables.

in the interpretation of the trends, and the few suggestions here offered are most tentative.⁷ In England anxiety about an increasingly burdensome population was quieted by the second half of the century, and there were even some procedural difficulties put in the way of persons who wished to go to America under indentures. No restraints, however, were placed on servants from Ireland and Scotland.⁸ For many years, the hazards of the ocean voyage and the vague ideas of perils in the new country acted as deterrents. Not only did those things tend to check a free flow of indentured white servants and freemen, but they gave positive emphasis to the slave trade. For instance, in 1663, the Company of Royal Adventurers Trading to Africa was able to secure official encouragement in the sale of their cargoes to the plantations, although Negro labor did not become an important factor in Maryland until the eighteenth century.⁹

Within the Province, the forces at work did little to add to the supply of labor, white or colored, whereas the demand strengthened as the plantation system grew. The more enterprising owner-laborers on small original tracts of land led the way to the help and hire plan on larger farms; but agricultural servants, at the end of their period of indenture, usually wanted independence to establish households of their own, thus depleting the available supply of labor for hire. Besides, Maryland's official policy toward slaves was not constantly one of open encouragement during those decades.¹⁰ Another labor group, the criminal, was never welcomed, and in 1676 the Assembly barred further imports of that class.¹¹ These considerations offer some explanation of the upward trend in prices for servants and slaves in Maryland during the second half of the seventeenth century.

⁷ This price study is part of an economic history of Maryland during the seventeenth century.

⁸ *Calendar of State Papers, Colonial Series: America and West Indies, 1661-1668*, nos. 32, 331 (London, 1880); G. L. Beer, *The Old Colonial System, 1660-1754*, 1:31 (New York, 1912).

⁹ *Ibid.*, 326. See also J. R. Brackett, *The Negro in Maryland* (Baltimore, 1889).

¹⁰ *Archives*, 1:533, 2:272, 19:167, 375.

¹¹ *Ibid.*, 2:540-541, 13:539.

The decline in cloth prices for three decades may be traced to at least two influences. First, there was an increasing supply of foreign merchandise as more ships came to Maryland for tobacco; and second, there was always a certain amount of home weaving, and by the last quarter of the century, the Assembly was actively promoting the planting of hemp and flax and the manufacturing of linens and woolens.¹² The upturn of price averages in the last decade probably resulted from England's war with France. At that time shipping was restricted, and, although domestic manufacturing was stimulated, the facilities in the Province were still inadequate to meet the established demand.

At present, the author has no explanation of the marked jump in prices for small livestock during 1675-77, and the same is true for the irregularity of cattle prices. The prices of livestock used predominantly as food need to be correlated with the vital statistics, but the necessary population figures are not available. Probably the value-determining influences were mainly domestic since the prohibitory import duties of the Restoration kept colonial meat products at home.¹³ Furthermore, Maryland forbade the exportation of sheep in 1672 and livestock products in 1695.¹⁴ On the other hand, the natural fecundity of horses, together with their very restricted use in farming and transportation, made them actually a nuisance. By 1671 further imports were nominally stopped by law, and after 1682 the keeping of stallions was great circumscribed.¹⁵ It is not surprising that the price of horses fell so decidedly.

Grains were generally scarce in Maryland during the seventeenth century. Tobacco cultivation was too strong a lure, and the trend of corn and wheat prices might indicate that the population increased faster than the grain supply during at least three of the decades under review. As the community became more

¹² Morriss, *Colonial Trade*, 35-36; Wyckoff, *Tobacco Regulation*, 54, 110; *Archives*, 2:300, 434, 7:324, 325, 13:169; *Calendar of State Papers, Colonial Series: America and West Indies, 1693-1696*, no. 1916.

¹³ Statutes of the Realm, 12 Car. 2, c. 4, 8, 23, 24; 18 Car. 2, c. 2; 22 Car. 2, c. 13.

¹⁴ *Archives*, 5:105, 19:223, 276.

¹⁵ *Ibid.*, 2:281, 333, 7:275, 482, 13:549.

settled, it is also probable that the taste for cultivated products of the soil became better established. The planting of grains had been urged, indeed demanded, as early as 1639 under the "two-acre law" which was continued until 1654, and in times of economic distress the exportation of cereals was prohibited.¹⁶

TABLE 1.—MEN SLAVES APPRAISED IN POUNDS OF TOBACCO

Prices per slave	1665-67		1675-77		1685-87		1695-97	
	Apprais- als	Men	Apprais- als	Men	Apprais- als	Men	Apprais- als	Men
2000							1	1
3000	2	5			1	1		
4000	4	4	5	6	1	4	4	4
5000			6	9	5	12	3	5
6000					1	1	8	8
7000					1	1		
Totals	6	9	11	15	9	19	16	18

TABLE 2.—DOWLAS CLOTH APPRAISED IN POUNDS OF TOBACCO

Prices per yard	1665-67		1675-77		1685-87		1695-97	
	Apprais- als	Yards	Apprais- als	Yards	Apprais- als	Yards	Apprais- als	Yards
9			4	76	3	137	1	2
12	1	4	9	271	10	368	2	29
15	3	144	5	202	4	160	7	65
18	1	72	2	78	4	39	1	32
21	2	23	2	25			2	75
Totals	7	243	22	652	21	704	13	203

TABLE 3.—HOGS APPRAISED IN POUNDS OF TOBACCO

Prices per hog	1665-67		1675-77		1685-87		1695-97	
	Apprais- als	Hogs	Apprais- als	Hogs	Apprais- als	Hogs	Apprais- als	Hogs
25					1	33	5	103
50	3	50	3	19	4	57	9	167
75	3	60	1	4	5	94	5	165
100	3	17	5	68	10	233	4	74
125			1	15	7	185	5	37
150			1	20			2	19
175			1	15	2	49	3	45
200			1	8	1	8	1	1
Totals	9	127	13	149	30	659	34	611

¹⁶ *Ibid.*, 1:84, 445, 3:443, 453, 19:225, 295.

TABLE 4.—HORSES APPRAISED IN POUNDS OF TOBACCO

Prices per horse	1665-67		1675-77		1685-87		1695-97	
	Apprais- als	Horses	Apprais- als	Horses	Apprais- als	Horses	Apprais- als	Horses
200							1	1
400					7	14	18	25
600					7	9	8	12
800			5	7	10	15	8	14
1000			3	3	6	14	1	1
1200			10	14	6	8	3	3
1400			6	7	1	1		
1600	2	2	11	14				
1800	1	1	4	4				
Totals	3	3	39	49	37	61	39	56

TABLE 5.—COWS APPRAISED IN POUNDS OF TOBACCO

Prices per cow	1665-67		1675-77		1685-87		1695-97	
	Apprais- als	Cows	Apprais- als	Cows	Apprais- als	Cows	Apprais- als	Cows
250					1	4	5	30
300	1	1			1	3	3	25
350					3	66	4	8
400	6	33	3	4	4	40	6	34
450	1	4	1	6	2	13	2	12
500	8	27	15	74	14	171	15	77
550	3	23	3	11	9	37	3	16
600	5	14	7	50	7	93	3	16
650	1	1	1	10				
700	1	5						
Totals	26	108	30	155	41	427	41	218

TABLE 6.—CORN APPRAISED IN POUNDS OF TOBACCO

Prices per bbl.	1665-67		1675-77		1685-87		1695-97	
	Apprais- als	Barrels	Apprais- als	Barrels	Apprais- als	Barrels	Apprais- als	Barrels
50	1	15	1	3				
60	4	42	4	23			2	8
70	3	32	7	7			2	10
80	3	130	9	83	4	21	4	21
90	1	616			4	67	2	31
100	1	3	14	71	11	126	6	107
110	1	2			1	4		
120					1	8	1	3
Totals	14	840	35	187	21	226	17	180

TABLE 7.—UNIT PRICE AVERAGES IN POUNDS OF TOBACCO, AND ARITHMETIC INDEXES FOR THE THIRTY ITEMS, INDIVIDUALLY AND IN CLASS GROUPS

Items	Average price in pounds of tobacco per unit				Arithmetic indexes			
	1665-67	1675-77	1685-87	1695-97	1665- 67	1675- 77	1685- 87	1695- 97
Servants, unit, 1 person								
Boys ¹⁷	1600 ¹⁸	1808	1964	2393	82 ¹⁹	93	101	122
	<i>1600</i>	<i>1800</i>	<i>2040</i>	<i>2400</i>	<i>82</i>	<i>92</i>	<i>104</i>	<i>122</i>
Men ²⁰	1383	1547	1618	1800	87	97	102	113
	<i>1350</i>	<i>1600</i>	<i>1440</i>	<i>1920</i>	<i>86</i>	<i>101</i>	<i>91</i>	<i>122</i>
Women ²¹	1042	1250	1767	1600	74	88	125	113
	<i>1200</i>	<i>1400</i>	<i>1680</i>	<i>1440</i>	<i>84</i>	<i>98</i>	<i>117</i>	<i>101</i>
Group average					82	90	110	117
					<i>84</i>	<i>97</i>	<i>104</i>	<i>115</i>
Slaves, unit, 1 person								
Children ²²	2000	3200	2833	3565	69	110	98	123
	<i>1900</i>	<i>3000</i>	<i>2880</i>	<i>2880</i>	<i>71</i>	<i>113</i>	<i>108</i>	<i>108</i>
Men	3667	4545	5000	5063	80	99	109	111
	<i>3500</i>	<i>4500</i>	<i>4800</i>	<i>5280</i>	<i>79</i>	<i>100</i>	<i>106</i>	<i>117</i>
Women	3556	4250	4000	5000	85	101	95	119
	<i>3000</i>	<i>4000</i>	<i>4800</i>	<i>5760</i>	<i>68</i>	<i>91</i>	<i>109</i>	<i>131</i>
Group average					78	103	101	118
					<i>73</i>	<i>101</i>	<i>108</i>	<i>119</i>

¹⁷ Boy servants having 2-9 years to serve; there is no noticeable correlation between prices and years of required service.

¹⁸ In Table 7 the items under "Average price in pounds of tobacco per unit" arithmetic means are given in Roman type and the medians in italics.

¹⁹ In the items under "Arithmetic indexes" in Table 7, the index from the means is given in Roman type and the index from the medians in italics. Each series of four index numbers has as its base the average of the corresponding prices in pounds of tobacco.

²⁰ Men servants having 7 months to 6 years to serve. All of the appraisals for 1675-77 are not used; the remainder does not change the frequency distribution.

²¹ Women servants having 7 months to 6 years to serve. All of the appraisals for 1675-77 are not used; the remainder does not change the frequency distribution.

²² Child slaves, boys and girls; the maximum age when given is 16 years.

TABLE 7.—Continued

Items	Average price in pounds of tobacco per unit				Arithmetic indexes			
	1665-67	1675-77	1685-87	1695-97	1665- 67	1675- 77	1685- 87	1695- 97
Cloth, unit, 1 yard								
Canvas	9.5 10.0	7.9 8.0	8.4 8.0	9.4 8.0	108 118	90 94	95 94	107 94
Dowlas	17.0 16.0	13.5 13.0	13.0 13.0	15.0 14.0	116 114	92 93	89 93	103 100
Linen	13.0 12.5	7.2 7.0	7.3 6.0	8.7 7.0	143 154	79 86	80 74	96 86
Serge	26.0 25.0	21.0 20.0	20.0 20.0	23.0 24.0	116 114	93 91	89 91	102 109
Group average					121 125	89 91	88 88	102 97
Small livestock, unit, 1 animal								
Barrows	143 150	192 200	139 120	156 142	91 98	122 131	88 78	99 93
Hogs	75 80	106 100	101 96	88 78	81 90	114 112	109 108	95 88
Shoats	41 33	42 46	42 39	33 24	103 89	105 124	105 105	83 65
Sows	115 100	174 155	94 84	139 96	88 92	133 142	72 77	106 88
Sheep	105 100	123 115	119 110	88 96	96 93	113 106	109 102	81 89
Group average					92 92	117 123	97 94	93 85
Horses, unit, 1 animal								
Colts	1000 800	859 800	385 360	389 360	152 138	131 138	59 62	59 62
Horses	1667 1660	1338 1400	800 720	595 500	152 155	122 131	73 67	54 47
Mares	1833 1900	1482 1500	654 588	549 480	162 170	131 134	58 53	49 43
Group average					155 154	128 101	63 61	54 51

TABLE 7.—*Concluded*

Items	Average price in pounds of tobacco per unit				Arithmetic indexes			
	1665-67	1675-77	1685-87	1695-97	1665- 67	1675- 77	1685- 87	1695- 97
Cattle,								
unit, 1 animal								
Bulls, 2-5 yrs.	214 200	220 200	281 300	234 240	90 85	93 85	119 128	99 102
Cows	506 500	522 500	494 480	434 480	103 102	107 102	101 98	89 98
Cows, with calves	597 600	589 600	578 600	522 564	104 102	103 102	101 102	91 95
Heifers, 2 yrs.	283 250	261 250	269 250	226 192	109 106	100 106	103 106	87 81
Heifers, 3 yrs.	367 400	348 300	403 382	343 360	101 111	95 83	110 106	94 100
Steers, 2-3 yrs.	283 263	273 300	283 300	249 216	104 97	100 111	104 111	92 80
Steers, 4-5 yrs.	433 450	463 450	516 480	433 438	94 99	100 99	112 105	94 96
Yearlings	153 150	120 100	121 120	115 120	120 122	94 81	95 98	91 98
Group average					103 103	99 96	106 107	92 94
Grains,								
Corn, unit, 1 bbl.								
	74 70	83 80	96 96	87 90	87 83	98 95	109 114	102 107
Wheat, unit, 1 bu.	20 20	42 40	46 48	48 48	51 51	108 103	118 123	123 123
Group average					69 67	103 99	114 119	113 115
Miscellaneous								
Pewter, unit, 1 lb. ²³	8.75 9.00	8.67 8.00	9.31 9.00	8.47 8.00	99 106	99 94	106 106	96 94
Salt, unit, 1 bu.	30 30	27 25	20 18	31 33	111 113	100 94	74 68	115 125

²³ Pewter in use.

TABLE 8.—MEDIAN OF THE ARITHMETIC INDEXES OF THE THIRTY ITEMS

Index number construction	1665-67	1675-77	1685-87	1695-97
Mean	100.0 ²⁴	100.0	101.0	97.5
Median	98.5	100.5	103.0	97.0

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²⁴ For a comparison with land prices during these same decades, see V. J. Wyckoff, "Land Prices in Seventeenth-Century Maryland," in the *American Economic Review*, 28:86 (March 1938).